# Managers' Segment Financial Reporting Choice: An Analysis Of Firms' Segment Reconciliations

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**ABSTRACT**

*Under SFAS No. 131, a company is required to provide a reconciliation of the total of the reportable segments' profit or loss to the firm's consolidated income. This paper investigates these segment disclosures and related determinants of managers' segment financial reporting choices. We focus on managers' decisions to report segment-to-firm level reconciliations (i.e., segment reconciliations (SERs)) – differences between firm-level and aggregated segment-level earnings. On average, we find that SERs are significant when the differences are not equal to zero. Firms with higher agency costs and greater accruals are less likely to report segment reconciliations. However, firms that have a greater number of segments, larger firms, and firms with higher leverage, losses, and greater earnings volatility are more likely to report SER≠0. Consistent with managers having some segment reporting discretion, our overall findings suggest a manager's segment reporting choice is partly driven by agency costs. Interestingly, among firms with reported segment reconciliations, firms with higher agency costs are more likely to report positive SERs. Consequently, this study documents a relation between proxies for agency costs and managers' decisions to report segment reconciliations. Policy implications and suggestions for future research are discussed in the paper.*

**Keywords:** SFAS No. 131; Segment Reconciliation Differences; Segment Financial Reporting; Determinants

## INTRODUCTION

The Financial Accounting Standards Board (FASB) adopted a number of fundamental changes to its standards for segment reporting by adopting Statement of Financial Accounting Standard No. 131 (SFAS No. 131) – *Disclosures about Segments of an Enterprise and Related Information*, in June 1997, which superseded SFAS No. 14. SFAS No. 131 established standards for reporting information about "operating segments" of an enterprise rather than following the "industry segment" standards under the previous segment reporting regime. The measure of segment profit or loss and segment total assets under SFAS No. 131 is the measure reported to the chief operating decision maker for purposes of making decisions about allocating resources to the segment and assessing its performance.[1] Therefore, a company may determine segment earnings on a basis that differs from consolidated operating earnings as defined by Generally Accepted Accounting Principles (GAAP) or excludes the effects of items attributable to that segment. In this situation, SFAS No. 131 requires that a footnote to the company's consolidated financial statements provide a segment reconciliation (SER) between what is reported at the aggregated segment level and what is reported at the consolidated firm level. For the purpose of this study, we focus on aggregated segment earnings and consolidated earnings reported in the firm's annual financial

[1] For the purpose of this study we only focus on segment profit/loss rather than revenues or total assets. We provide some discussion about this focus in the paper.

statements.[2]

This paper examines these segment reconciliations by: (1) determining whether these segment reconciliations are significant in magnitude; (2) examining whether they have value relevance; and (3) examining the determinants of managers' decisions to report differences between what is reported at the aggregated segment level and the consolidated firm level, which then require segment reconciliations. Our findings show that segment reconciliations are significantly value relevant, which suggests that these reconciliations should be of concern to investors, managers, auditors, and regulators alike.

Segment information can be difficult for outsiders to observe and monitor because of the uneven compliance among reporting companies under SFAS No. 131 (Paul & Largay, 2005). The wider discretion allotted in SFAS No. 131 has led to concerns that regulators have opened the floodgates for accounting manipulation (Reason 2001). Some studies have concluded that giving management discretion within GAAP deteriorates earnings quality and predictability (Dechow et al., 2010; Matsumoto, 2002). Enron (although an extreme case and not the focus of this study) is an example of a firm whose management used its discretion to manipulate segment earnings.[3] However, other studies have concluded that giving management discretion under GAAP improves earnings predictability (Elliott & Philbrick, 1990; Ewert & Wagenhofer, 2005). Because of this discretion in reporting segment earnings, it is critical that the reconciliation provide the necessary information for investors to reconcile "management approach" derived earnings with total aggregated earnings reported using GAAP measures.

Earlier studies have focused on how managers internally operate the firm's segments by examining how managers allocate capital across and between segments. For example, prior literature has shown that agency problems exist in firms when internal capital markets are inefficient and when the firm engages in subsidizing poorly performing segments with funds from better performing segments (Stulz, 1990; Lamont, 1997; Shin & Stulz, 1998). Berger and Hann (2007) find that in the pre SFAS No. 131 period, managers were not disclosing segments with low abnormal profits in firms with high agency costs. Therefore, the extent of agency costs in the firm should play an important role in a manager's segment disclosure choice in order to hide unprofitable segments or the cross-subsidization of unprofitable segments, especially when firms are choosing not to disclose SERs, by reporting aggregated segment profits equal to firm-level profits. On the other hand, managers can face proprietary costs of segment disclosure if through the segment reconciliation they report segments with high abnormal profits and this, in turn, attracts greater competition.

Anecdotal evidence also supports the theory that agency costs influence managers' decisions in disclosing or not disclosing segment reconciliations. For example, financial analysts often relate a manager's financial reporting transparency to the level of detailed segment information disclosed. Ben Johnson states, in his analysis of Agrium, Inc., "The detailed segment breakdowns and honest performance assessments increase the company's transparency and indicate a shareholder-friendly management team." Also, in his analysis of the executive team at Activision Blizzard, Inc., analyst Norman Young says in his report, "However, we give Activision (management) high marks for its clear disclosure of segment information and relevant business trends, as well as having a non-staggered board of directors." Other analysts will even take a more direct approach and change their estimate of the firm's discount rate, at least partly, based on the firm's segment disclosure. For example, Rafael Garcia writes of CA, Inc., "While the company's operations have become more stable, we use an 11% cost of equity to reflect the risk of new and planned acquisitions… and limited disclosure of segment data."[4]

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[2] Segment reconciliations may also be reported for segment revenues and totals assets. Because of the different classifications of reported revenues (e.g., some firms report gross revenues while others report net revenues) and investors' interest weighing more heavily on earnings rather than revenues, we focus on earnings in this study.

[3] At Enron Energy Services (EES), Richard Causey and others concealed massive losses by fraudulently manipulating Enron's "business segment reporting." At the close of the first quarter of 2001, Enron, with Causey's approval, "reorganized" its business segments and moved a large portion of EES's business into Enron North America (ENA), part of Enron's wholesale energy business segment. The "reorganization" was fraudulently designed to conceal hundreds of millions of dollars of losses at EES, Enron's heavily touted retail energy trading business, which it would otherwise have had to disclose. (SEC v. Richard Causey, Civil Action No. H-04-0284)

[4] http://www.morningstar.com/analyst-research/stock-reports.aspx.

The theory of segment reconciliations is at an early stage and still requires development of a critical mass of research literature. This paper contributes to prior research on segment disclosure in several ways. As one of the first studies to examine these segment reconciliations, it is somewhat exploratory in nature. However, it further contributes to our understanding of segment disclosure practices by examining a unique setting in which management has discretion, based on how the firm is managed internally, to report segment information in a manner that may not be consistent with firm-level "GAAP" reported earnings measurements. Additionally, this analysis of SERs allows for observation of the effect of mandatory disclosure of segment reconciliations on discretionary segment earnings measurement.[5]

This study finds that segment reconciliation differences, when they exist, are significant under the SFAS No. 131 segment reporting regime. First, from an overall perspective, the study examines the determinants of firms that report SER=0 compared to those that report SER≠0. Our findings show that firms that have a greater number of segments, larger firms, and firms with higher leverage, losses, and greater earnings volatility are more likely to report SER≠0. However, firms with higher agency costs and greater accruals are less likely to report SER≠0. Our finding of higher agency costs being associated with nondisclosure of segment information (SER=0) indicates that firms with high agency costs will be more likely to avoid detailed segment disclosure so as to not reveal segments with abnormally low profits, cross-subsidization of poorly performing segments from the excess funds of better performing segments, or inefficient segment transfers. These results also suggest that firms that have high proprietary costs are more likely to report SER≠0, and, thereby, provide a segment reconciliation. This signifies that potential entrants could view nondisclosure of segment reconciliations as firms reporting SER=0 in order to avoid disclosure and hide segments with abnormally high profits.

We then partition the firms with SER≠0 into two categories (SER<0 and SER>0) in order to examine whether the sign of the SER further determines managers' segment reporting choices for these two types of firms. This study finds that SERs are significantly different when comparing SER<0 and SER>0 under the SFAS No. 131 segment reporting regime. Our empirical findings show that larger firms, and firms with higher leverage and ROA are more likely to report aggregated segment-level earnings as less than firm-level earnings (SER>0). Furthermore, this study finds that firms with a greater number of segments, greater accruals, greater analyst following, a loss, greater aggregated segment earnings, and a Big N auditor are less likely to report SER>0. However, when SER≠0, firms with higher agency costs are more likely to report SER>0. Our overall findings suggest that a manager's segment reporting choice is partly driven by agency costs. Hence, this study documents a relation between proxies for agency costs and managers' decisions to report segment reconciliations. Policy implications and suggestions for future research are discussed in the paper.

The remainder of this paper is organized as follows: Section II provides background on SFAS No. 131 and reviews the related literature; Section III discusses the research design and development; Section IV presents the sample selection criteria and discusses the empirical findings; and Section V provides a summary and conclusion.

## BACKGROUND ON SFAS NO. 131 AND RELATED LITERATURE

### Background on SFAS No. 131

SFAS No. 14, *Financial Reporting for Segments of a Business Enterprise*, introduced by the FASB in 1976, was criticized for being too vague. In response to the criticism, in June 1997, the FASB introduced SFAS No. 131, *Disclosures about Segments on Enterprise and Related Information*, which superseded SFAS No. 14, effective for fiscal years beginning after December 15, 1997. This new standard was developed primarily to enable external users to view companies through the eyes of management. In effect, SFAS No. 131 requires that companies report externally the same information used internally for evaluating segment performance and deciding resource allocation to segments, a requirement known as the "management approach."

SFAS No. 131 requires firms to report segment information based on the way management evaluates the operating performance of its business units (operating segments) internally, rather than on the traditional line of

[5] It is beyond the scope of this study to disentangle these effects. See Figure 1 for an illustration of the derivation of SERs.

business classification (industry segments) previously prescribed under GAAP (SFAS No. 14). Many supporters expected that the management approach adopted by SFAS No. 131 would enable outsiders to see an enterprise through "insiders' eyes," reducing information asymmetry between internal and external users by better aligning internal and external financial reporting. As SFAS No. 131 states, "The objective of requiring disclosures about segments … is to help users of financial statements: (a) better understand the enterprise's performance; (b) better assess its prospects for future net cash flows; and (c) make more informed judgments about the enterprise as a whole." However, the ambiguity inherent in the standard, with respect to the identification of reportable segments and the exact measures of profitability to be presented, led others to question whether the objectives of the standard could be reached. The ambiguity inherent in the standard led some to refer to SFAS No. 131 as the "unstandard standard" because of the potential lack of consistency, comparability, and reliability of segment-level information within firms and across firms (Reason, 2001).

Under SFAS No. 131, the presentation of a firm's reported segment information must be consistent with a firm's management or organizational approach.[6] In determining a measure of profit or loss, SFAS No. 131 specifies "The amount of each segment item reported shall be the measure reported to the chief operating decision maker for purposes of making decisions about allocating resources to the segment and assessing its performance" (FASB, 1997). Firms may report a measure of profit or loss for its segments that differs from the measures of earnings computed in the consolidated annual report. Therefore, the measures of earnings reported at the segment level may or may not be consistent with the measures provided at the firm level (e.g., earnings before interest and taxes, or net income). As a result, the whole may not equal the sum of its parts, thereby leading managers to provide segment reconciliations (i.e., SERs). Consequently, the segment reconciliations should provide vital information that assists the financial statement users to understand any differences between management defined earnings (i.e., management approach defined earnings may differ from GAAP) compared to GAAP defined earnings.

Under SFAS No. 131, a company is required to provide a reconciliation of: (1) the total of the reportable segments' profit or loss to the public entity's consolidated income *before* income taxes, extraordinary items, and discontinued operations (if an entity allocates these items to segments, the entity may reconcile to income or loss *after* these items); (2) the total of the reportable segments' revenues to the entity's consolidated revenues; (3) the total of the reportable segments' assets to the entity's consolidated assets; and (4) the total of the reportable segments' amounts for every other significant item of information disclosed to the corresponding consolidated amount. Significant reconciling items should be disclosed separately.

SFAS No. 131 was intended to reduce information asymmetry between internal parties of the firm and external users of the firm's financial reports. However, it may have also led to increased asymmetries and a decline in consistency and comparability across firms (Botosan & Stanford, 2005). Moreover, the flexibility provided in SFAS No. 131 may lead to reported segment-level performance measures which, in the aggregate, do not equate to firm-level performance measures. Appendix B provides an example of the segment reconciliation in Form 10-K of Dover Corporation for the fiscal year ended December 31, 2010. Dover Corporation reports four reportable segments: Industrial Products, Engineered Systems, Fluid Management, and Electronic Technologies. Dover's segment reporting choices result in reporting SERs<0 because Dover's aggregated segment-level earnings are higher than its firm-level consolidated earnings. Dover also provides a reconciliation of firm-level consolidated earnings and the aggregated segment-level earnings in note 14 of its 10-K for the fiscal year ended December 31, 2010. As shown in Appendix B, the SERs represent the corporate expense, net interest expense, and provisions for taxes. The company disaggregates assets.[7]

Segment reporting continues to be a critical element of financial reporting for public companies. The SEC staff has continued to emphasize segment disclosures in its review of periodic financial statements (Ernst & Young, 2009). If the chief operating decision maker receives reports of a component's operating results on a quarterly or more frequent basis, the staff may challenge a registrant's determination that the component is not a segment for

[6] Under SFAS No. 131, operating segments are identified as components of an enterprise about which separate financial information is available that is evaluated regularly by the chief operating decision maker in deciding how to allocate resources and in assessing performance.

[7] http://www.sec.gov/Archives/edgar/data/29905/000095012310014502/y81455e10vk.htm#303

purposes of SFAS No. 131 unless reports of other overlapping sets of components are more clearly representative of the way the business is managed. On a few occasions, the staff has requested copies of all reports furnished to the chief operating decision maker if the reported segments did not appear realistic for management's assessment of a company's performance or conflicted with that officer's public statements describing the company. The staff also has reviewed analysts' reports, interviews by management with the press, and other public information to evaluate consistency with segment disclosures in the financial statements. Where that information revealed different or additional segments, amendment of the registrant's filings to comply with SFAS No. 131 was required.[8]

As we mentioned previously, segment reporting guidelines under SFAS No. 131 remain under scrutiny. James J. Leisenring, a member of the FASB during the issuance of SFAS No. 131, dissented to the guidelines of the standard as it relates to measurement of segment profit or loss to be reported (IASCF 2009). Though Leisenring supports the management approach of identifying reportable operating segments, he claims that the ambiguity in outlining measurements of segment profit or loss may lead to decreased comparability across firms. Subsequently, the Securities Exchange Commission (SEC) continues to raise concerns about the implementation of SFAS No. 131. For example, the SEC continues to encounter cases of inappropriate application of the standard (*SEC v. Richard Causey*, 2004; Bayless, 2001; Turner, 1999) and intends to ensure that segment disclosure requirements are a central focus of SEC staff reviews. Hollie et al. (2011) assess various financial reporting frauds that have occurred at the segment level, finding that the SEC is concerned with segment disclosure compliance and has pursued violators of the standard. The SEC's concerns with SFAS No. 131, and existing segment reporting practices, suggest that SFAS No. 131 may not be as effective as anticipated in reaching its proposed objectives.

This study intends to shed more light on this issue by evaluating the factors for managers' segment reporting choices given that the effectiveness of SFAS No. 131, using segment-to-firm-level earnings reconciliations, relates to segment earnings measurements based on managers' decision making that does not necessarily adhere to earnings measurement guidance under GAAP. [9] For example, in its 1998 10-K, Caterpillar, Inc., explicitly states that its segment reporting, in accordance with SFAS No. 131, has limited usefulness to external readers of its financial statements. It discloses traditional GAAP-based financial results for all business lines in its MD&A. It does not provide details of the reconciliation between its firm-level and segment-level measurements required under SFAS No. 131. In Caterpillar's 2010 annual report, it continues to state its concern about the usefulness of its segment disclosures required under SFAS No. 131. However, it does provide a full reconciliation for its segment reconciliation. There are many examples of these inconsistencies and variations in firms' segment reporting under the SFAS No. 131 segment reporting regime.

## RELATED LITERATURE

While prior research on SFAS No. 14, which preceded SFAS No. 131, generally finds that segment reporting does provide an incremental benefit over aggregated data for the prediction of future earnings (e.g., Kinney, 1971; Collins, 1976; Chen & Zhang, 2002). Prior literature related to SFAS No. 131 segment reporting has mostly focused on the change in the number of reported segments or the change in the degree of disaggregation upon the adoption of SFAS No. 131 (Ettredge et al., 2000; Herrmann & Thomas, 2000; Street et al., 2000), and subsequent changes in analyst forecasts (Venkataraman, 2001; Berger & Hann, 2003; Botosan & Stanford, 2005; Mande & Ortman, 2002). However, prior research has not focused on segment reconciliations and, therefore, there is limited evidence on managerial decision choices as it relates to the disclosure of the measurement of segment earnings under the SFAS No. 131 segment reporting regime.

Several extant studies examine the effect of SFAS No. 131 on financial reporting. The general findings suggest, on one hand, that agency costs may drive managers to disclose segment data voluntarily to reduce

[8] http://www.sec.gov/divisions/corpfin/acctdisc.htm#P261_47756

[9] While segment reporting using the management approach is in accordance with GAAP, how a company chooses to report revenue, earnings, expenses, and other financial data at the segment level may differ from the derivation of such components under GAAP. For example, a firm may choose to recognize sales at the time a sales agreement is made for segment reporting, while GAAP, at the consolidated reporting level, does not allow this. This study's reference to GAAP or non-GAAP is solely based on the derivation of earnings at the segment level.

information asymmetries between managers and market participants (Botosan & Stanford, 2005; Piotroski, 1999). On the other hand, results of segment reporting studies also suggest that proprietary costs are a major factor in segment reporting behavior. These studies find evidence suggesting that managers attempt to protect abnormal profits from competitors through the nondisclosure of pertinent segment information (e.g., Hayes & Lundholm, 1996; Harris, 1998).

In the case of mandated increases in disclosure requirements, Nagarajan and Sridhar's (1996) model indicates that such mandates may induce firms to: (1) reduce the value relevance of their disclosures, and (2) fail to disclose some value-relevant information.[10] Therefore, requiring more mandated disaggregated disclosures could increase information asymmetry and actually impede the proposed benefits of increased mandated disclosure. Nagarajan and Sridhar's theoretical finding would be most consistent with managers protecting abnormal profits or proprietary information by providing less relevant segment disclosure to fulfill SFAS No. 131 mandates, which is more likely when agency problems exists.

Berger and Hann (2007) find that only the agency cost motive leads to the observed segment reporting behavior. After examining financial reports, pre- and post-SFAS No. 131, they find that firms with higher agency cost exposure tend to aggregate, thereby concealing, the results of less profitable segments in the pre-SFAS No. 131 period. Specifically, they find evidence that the new segments reported tend to have lower abnormal profits than the old segments when the agency cost motive dominates, suggesting that managers used their discretion to hide the results of underperforming segments. In contrast, Botosan and Stanford (2005) find that the flexibility of SFAS No. 14 provides firms with incentives to hide abnormal profits rather than conceal poor performance; that is, more disaggregation under SFAS No. 131 reduces these firms' abnormal profits. According to the theoretical literature (e.g., Nagarajan & Sridhar, 1996), this reduction may, in turn, induce firms to reduce the value relevance of their segment disclosures, thereby impeding the proposed benefits of SFAS No. 131. Botosan and Stanford (2005) suggest that managers may aggregate segment information to protect abnormal profits under SFAS No. 14, providing evidence refuting the previously alleged exploitation of SFAS No. 14. Rather than using the flexibility under SFAS No. 14 to hide poor performance, they find managers were actually using it to hide abnormal profits.

Hope and Thomas (2008) test the agency cost hypothesis in the context of geographical earnings disclosures. They find that geographic segment non-disclosing firms, relative to those that disclosed geographic earnings, experience greater agency problems. They also show that when firms do not disclose geographic segment information, this reduces the ability of shareholders to monitor managers, which also leads to lower foreign profit margins and lower firm value in the post-131 period. Wang et al. (2011) investigate the interplay of managers' motives to conceal versus reveal cross-segment differences in earnings growth in multi-segment firms. Similar to those of Hope and Thomas (2008), their findings suggest that managers of firms with greater agency problems tend to engage in self-interested behavior such as empire-building. On the other hand, there is evidence that managers are no longer using their discretion opportunistically in the post-131 period. Hann and Lu (2009) find a kink in the distribution of segment profits and evidence of managers under-allocating overhead costs to inflate segment profits only in the pre-131 period and not the post-131 period. They show that an increase in the cost allocation transparency as well as an increase in the consistency between external and internal reporting brought about by SFAS 131 has led to a reduction in managers' abilities to manipulate segment profits.

A subsequent concurrent study by Ettredge and Wang (2011) also examine the determinants of "Gaps," which is similar to how we have defined SERs. They examine the determinants as well and investigate whether aggregated segment earnings are more persistent and informative than corporate earnings when Gaps exist. Their results suggest that when Gaps exist, the aggregated segment earnings are modestly more persistent than are corporate earnings. This difference appears to be attributable to negative Gaps. When negative Gaps exist, the aggregated segment earnings are more informative (in terms of its association with concurrent stock returns) than are corporate earnings. When positive Gaps exist, summed segment income has a weaker association with concurrent stock returns than corporate earnings. Their findings that negative Gaps are more informative than positive Gaps are consistent with our finding that firms with positive SERs are more likely to have higher agency costs. Our study differs from Ettredge and Wang (2011) by providing evidence that when SERs exist they are

[10] SFAS No. 131 is a mandated disclosure requirement of GAAP.

significant and that SERs are value relevant. Second, we use a determinants model that focuses on managers' decisions to report segment reconciliations, and then we further examine the determinants of positive and negative SERs. Our study is less concerned with whether, or how, managers aggregate segments than with the net effect of managers' identification and measurement of segment earnings on the financial statements as a whole. This study focuses primarily on the deviation of aggregated segment-level earnings from firm-level consolidated earnings. As such, it is the first study to investigate the significance and determinants of segment reconciliations.

## RESEARCH DESIGN & DEVELOPMENT

### Value Relevance

We first determine that segment reconciliations are statistically significant in magnitude, and then determine whether SERs should have value relevance. In optimal form, the reconciliation of aggregated segment earnings to the consolidated financial statement earnings should quantify and clearly explain each material reconciling item. Effects of measurement differences should be identified, and asymmetrical allocations among segments should be highlighted. Given this requirement of SFAS No. 131, we expect that SERs will be value relevant. We use the following model to assess the value relevance of SERs:

$$MVE = \gamma_0 + \gamma_1*(|SER|) + \gamma_2*(UE) + \gamma_3*(|SER|* UE) + \varepsilon \quad (1)$$

where:

MVE = the market value of equity defined as common shares outstanding (Item #25) times end of fiscal year price (Item #199).
|SER| = the segment reconciliation which is the absolute value of the difference between firm-level operating income after depreciation (Item #178) and the sum of segment operating profits (Segment Item OPS).
UE = unexpected earnings measured as operating income after depreciation (Item #178) in year t minus operating income after depreciation (Item #178) in year t-1.

All variables are scaled by total assets following Brown et al. (1999).

### Determinants of Logistic Models

The aim of this study is to identify the determinants of managers reporting a segment reconciliation. Logit analysis is used to determine the association of the independent variables with the dichotomous (SER versus non-SER) segment reconciliation reported by managers as the dependent variable. Segment reconciliation difference (SER) is the difference between firm-level earnings, which are reported on the income statement in the annual report in year *t*, and aggregated segment earnings (AGSEG), which is the sum of all segment earnings reported for the firm in year *t*. Figure 1 illustrates the potential differences between aggregated segment-level and firm-level earnings. It presents: (1) segments determined by management to be un-reportable according to the thresholds of the relevant standard; (2) measures of segment profit or loss that differ from the traditionally accepted measures (i.e., GAAP) of profits reported at the firm level; (3) unallocated gains and revenue; and (4) unallocated losses and expenses.

Three possible managers' segment reporting choices related to the sign of the reconcilable differences are possible: (1) when firms report no reconcilable differences – for example, aggregated segment-level earnings equal total firm-level earnings, SER=0; (2) when firms report firm-level earnings greater than aggregated segment earnings, SER>0; and (3) when firms report firm-level earnings less than aggregated segment earnings, SER<0. Firms are required to disclose a detailed segment reconciliation only in instances (2) and (3). This study tests for the determinants of managers' segment reporting choices in two different situations. First, it examines managers' decisions that result in reporting SER=0 or SER≠0. Second, it examines managers' decisions that result in reporting SER>0 and SER<0. Since SERs represent the difference between aggregated segment earnings and firm-level consolidated earnings, it seems appropriate to investigate the sign of the difference, that is, positive or negative SERs.

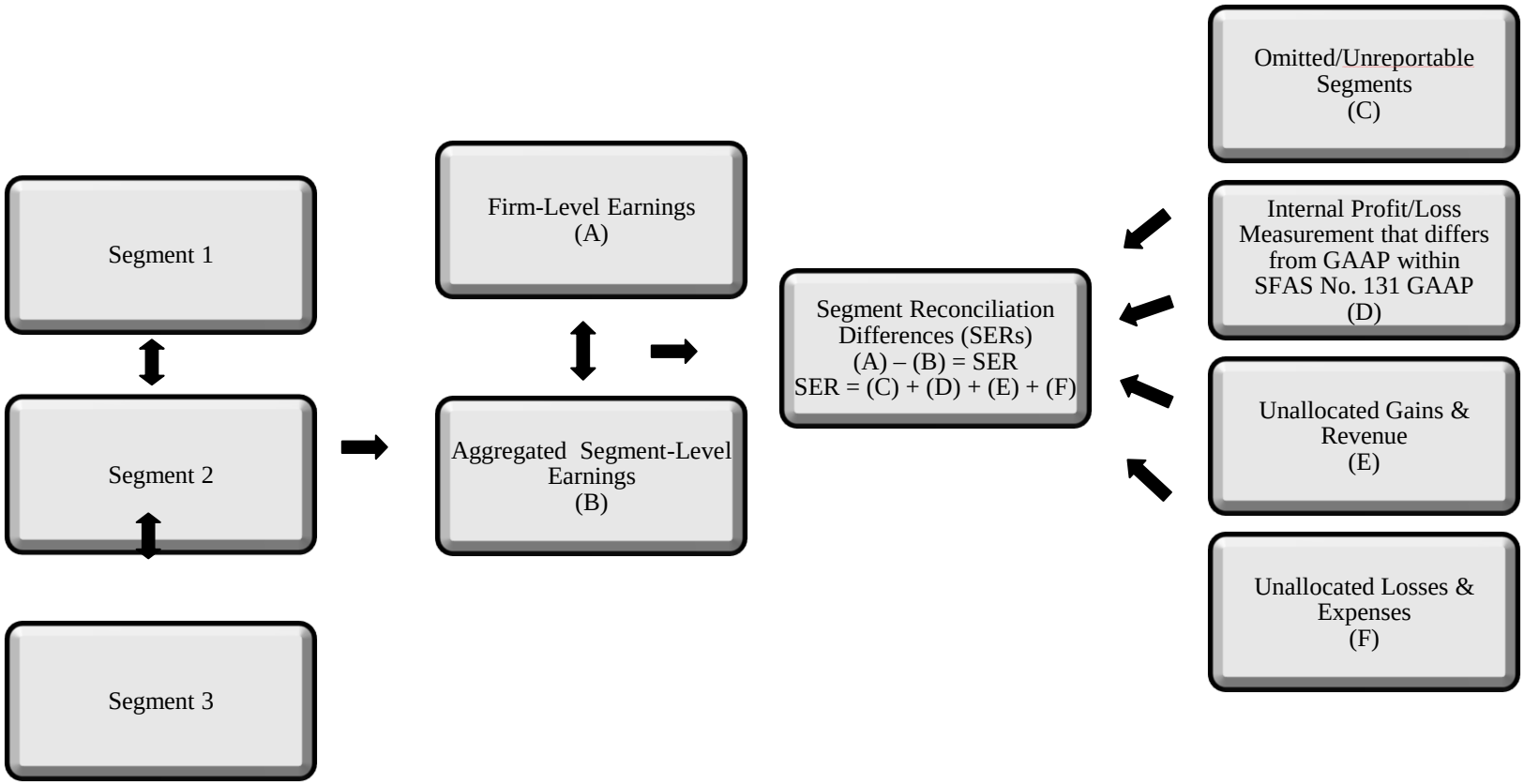


**Figure 1**
**Illustration of Segment Reconciliation Reporting Differences**

This study employs a logistic regression in order to investigate the likelihood that a manager reports SERs by evaluating a firm's decision about whether or not to report aggregated segment-level earnings as different from its firm-level earnings. The first logistic model tests the determinants of SER≠0 for the study's first sample set of SER=0 and SER≠0. The second logistic model tests the determinants of SER≠0 for the second sub-set sample of SER>0 and SER<0. The independent variables remain the same for both logistic regressions. The study's empirical model is as follows:

SERA = *f* (AGENCY, ROS, NSEG, ACC, SIZE, LEV, FOL, MB, LOSS, AGSEG, EARN_VOL, ROA, BIG N, HERF) (2)

**Agency Costs of Segment Disclosure**

Prior literature has shown that agency problems exist in firms when internal capital markets are inefficient and when the firm engages in subsidizing poorly performing segments with funds from better performing segments (Stulz, 1990; Berger & Ofek, 1995; Lamont, 1997; Shin & Stulz, 1998). For example, Stulz (1990) examines managers' discretion in investment decisions and finds that managers invest too little in projects with positive net present value and too much in projects with poor investment prospects. These underinvestment and overinvestment costs are caused by the informational asymmetry between managers and shareholders and managers' inefficient use of the free cash flow in the firm. Berger and Ofek (1995) analyze changes in firm value as a result of a firm's diversification strategy. The authors identify a firm's overinvestment in a segment with limited investment growth as one reason for a decline in firm value. A second reason for which they document a loss in value is due to a firm's highly performing segments cross-subsidizing the firm's low performing segments, a finding that is consistent with the evidence in Stulz (1990).

Lamont (1997) studies internal capital markets of multiple segment firms and the capital expenditures of these segments in response to a macroeconomic shock. The author finds that segment cross-subsidization leads to internal capital markets allocating funds in a suboptimal manner. In a related study, Shin and Stulz (1998) investigate whether internal capital markets in firms are beneficial by allocating funds to the divisions that have the most profitable projects. The authors conclude that investment by a firm's segment depends significantly on the cash flow and performance of the firm's other segments, and not necessarily the segment's own cash flow. These studies show that agency problems exist for firms with inefficient capital markets where managers may withhold information regarding segments with abnormally low profits. In other words, managers could use their discretion to report SER=0, for example, through the subjective allocation of corporate overhead costs, to make aggregated segment earnings equal to firm-level income. Managers would then not have to disclose detailed segment information in compliance with SFAS No. 131 and can exploit this opportunity by concealing abnormally low segment profitability.

Berger and Hann (2007) argue that, when the agency cost motive dominates, managers tend to hide abnormally low profitability in disclosing segment information to avoid the attention of external monitors. The authors compare restated segment information in the pre- and post-SFAS No. 131 periods to analyze the motives under which managers attempt to hide low or high abnormal profits. They find that, in the post-131 period, newly reported segments have lower abnormal profit consistent with their agency cost hypothesis. This is because managers do not want to expose unresolved agency problems within the firm in order to avoid stricter oversight. Withholding the reporting of segments with low profitability may result in SER>0 or SER<0. For example, SER is positive when managers select not to disclose the segment with lowest but positive profitability. On the other hand, SER is negative when managers select not to disclose the segment with a loss. In both cases, managers hide low/high profitability due to agency problems.

In order to test the agency cost hypothesis as a determinant for managers' segment reporting choices, we follow Berger and Hann (2007) for the agency cost sample partition in this study. As a sensitivity check, we also construct an alternative agency cost variable following Hope and Thomas (2008), as discussed below. Berger and Hann use prior literature to identify two situations under which firms would face an agency cost motive in reporting segment information. First, they use a measure to capture whether a firm is subsidizing poorly performing segments from the excess funds of better performing segments. If the cross-subsidization is occurring, this is evidence of

agency problems. The authors capture the difference between a segment's capital expenditures and the cash flow the segment generates. Second, they assess the decline in value in the firm as a result of the inefficient segment transfers. To measure this inefficiency, they compare a segment's return on sales to the return on sales of the other segments in the firm. If the segment's return on sales is abnormally low, this is also evidence of agency problems at the firm. A firm is classified as having an agency cost motive if it has both positive excess capital expenditures (as measured in the model below) and has a return on sales that is less than the weighted average of all the segments in the firm.

$$\text{Max } \left[\frac{\text{Segment Excess CAPX} - \text{Firm-Level Excess CAPX}, 0}{\text{Market Value of Equity}}\right] \times 100$$

where:

Excess CAPX = max [CAPX – (OPS + DEP), 0];
CAPX = capital expenditures;
OPS = operating profits;
DEP = depreciation expense.

Again following Berger and Hann (2007) for consistency and comparability, we assume that absent agency problems managers would only choose to withhold segment information if proprietary costs existed. Therefore, our sample classified as firms with a proprietary cost motive includes all firms not classified as having agency cost motives, as described above. Accordingly, our AGENCY variable is defined as 1 if firms are classified as having agency cost motives, and 0 otherwise (by design these classified have proprietary cost motives). If firms are using SERs to hide unprofitable segments or the cross-subsidization of unprofitable segments, the extent of agency costs in the firm can affect a manager's segment disclosure choice. We expect that firms with higher agency costs are more likely to report aggregated segment earnings equal to firm-level earnings.

As an alternative measure of agency costs we follow Hope and Thomas (2008) to ascertain whether our results will hold using a variable that captures a different dimension of agency costs. Hope and Thomas find that managers tend to avoid disclosure of geographic segment information in order to mask greater expansion of foreign sales, lower foreign profit margins, and lower firm value in the post-SFAS No. 131 period. Similar to Hope and Thomas, we classify firms as geographic segment disclosers if they report earnings for at least two foreign geographic segments in the first two years following the adoption of SFAS No. 131. Since Hope and Thomas find that nondisclosers are more likely to have higher agency costs in the post-SFAS No. 131 period, we define our alternative agency cost variable as equal to 1 if the firm is classified as a geographic segment discloser, and 0 otherwise.

Anecdotal evidence also suggests that financial analysts view nondisclosure of segment reconciliations as indicative of opaque management and weak corporate governance. For example, analyst Scotts Burns states in his report on Air Lease Corporation, "Besides this, the company has released limited data on how Alcan will look going forward. Key items such as historical inter-segment sales and future pricing agreements haven't been disclosed." Rod Bare writes of Garmin, Ltd., "Garmin's good corporate governance is adequate with conservative accounting practices, good segment disclosure, and modest compensation relative to the technology industry."[11] These examples suggest that analysts interpret nondisclosure of segment reconciliations (SER=0) with higher agency costs due to managers withholding vital information which could assist in properly valuing the firm.

**Firms with Losses**

In the presence of losses, earnings fail in their traditional role as an indicator of firm value (Hayn, 1995; Collins et al., 1997). Additional financial information provided through "management approach" segment disclosure is likely to improve estimates of a firm's value. In addition, since loss firms are more likely to be financially distressed, segment information presented through management's eyes may help market participants assess the

[11] http://www.morningstar.com/analyst-research/stock-reports.aspx

 

firm's viability as a going concern. Accordingly, we expect managers of firms with losses to report earnings at the segment level equal to firm-level earnings as a way to avoid detailed disclosure of segment information and simultaneously comply with SFAS No. 131 since no disclosure is required. If managers use their discretion (management approach) under the SFAS No. 131 segment reporting regime to disguise losses at the segment level, it is more likely that such managers would not report segment reconciliations, consistent with Hope and Thomas (2008).

**Return on Assets**

Prior literature suggests that managers attempt to protect abnormal profits from competitors through the nondisclosure of segment information (e.g., Hayes & Lundholm, 1996; Harris, 1998). In addition, Berger and Hann (2007) find that firms with higher agency cost exposures attempt to aggregate segments in the pre-SFAS No. 131 period when the segments are less profitable. A higher return on assets makes it more likely that managers have certain segments that are relatively less asset intensive and more efficient in terms of producing profits in relation to their total amount of debt and equity. When firms are less profitable and more inefficient, we anticipate that managers would exhibit more discretion in reporting segment-level earnings equal to firm-level earnings. Therefore, managers would not be required to provide a segment reconciliation and could more effectively conceal segments with abnormally low profits, also consistent with Hope and Thomas (2008).

**Accruals**

Accrual-based earnings include managers' subjective estimates of uncertain future events, and managers have incentives to use their reporting discretion opportunistically (Watts & Zimmerman, 1986; Dye & Verrecchia, 1995; Holthausen et al., 1995). Additionally, Berger and Hann (2007) provide evidence to suggest that managers may strategically aggregate segments in order to mask abnormal underperformance. Rather than examine the strategic identification of reportable segments here, we examine whether a relationship exists between SERs and firm accruals. We expect that managers' segment reporting behavior is affected by accruals at the firm level. For example, underperforming firms may exhibit more positive accruals to mask underperforming segments. Furthermore, firms with greater levels of accruals may have more discretion in disaggregating accruals across segments, thereby potentially using accruals to report aggregated segment-level earnings equal to firm-level earnings in order to avoid detailed disclosure of underperforming segments.

**Big N Auditors**

Big N auditors[12] have been shown to be associated with more conservatively reported earnings than non-Big N auditors (Basu et al., 2001; Reynolds & Francis, 2000; Thomas, 1996; Simunic & Stein, 1996; DeFond &Subrahmanyam, 1998). These, and other, studies have shown that the central reason for this tendency toward conservatism is mainly attributed to the Big N auditors' desire to decrease their legal liability exposure and potential harm to their reputations (Choi et al., 2008; Francis & Wang, 2004). Litigation exposure has also been found to be a stronger driver of audit quality than reputation protection (Khurana & Raman, 2004). Between 1994 and 1997, Big N auditors fired approximately 275 high-risk, publicly traded clients in order to improve their reputations (MacDonald, 1997). Prior research has also shown that clients of Big N auditors tend to report lower discretionary accruals compared to non-Big N clients (Becker et al., 1998; Francis et al., 1999; Krishnan, 2003). Reporting aggregated segment-level earnings greater than firm-level earnings might be viewed as being less conservative than reporting aggregated segment-level earnings less than, or equal to, firm-level earnings. Additionally, clients with lower discretionary accruals can be expected to have less discretion in disaggregating accruals across segments, implying that aggregated segment-level earnings will be reported as being less than, or equal to, firm-level earnings.

[12] Chen and Zhou (2007) find that 89% of Andersen clients chose a Big 4 firm as the successor auditor. Please note that this a lower bound figure because they exclude 35% of the original sample, which does not contain variables related to corporate governance or for firms who switched auditors before October 15, 2001. Therefore, we do not believe that including Andersen clients in our sample creates a significant measurement error in the Big N variable.

**Leverage**

Segment information disclosure can be considered an instrument used by firms to reduce the monitoring costs for creditors. When firms have high leverage, creditors will urge them to disclose more information so they can better handle their own credit risk (Hossain et al., 1994). For example, some studies show that diversified firms obtaining long-term capital externally were more likely to disclose segmental financial data voluntarily (Salamon & Dhaliwal, 1980). Segment disclosure information is, therefore, of importance to creditors, as it helps them evaluate risk correctly. For that reason, we expect a positive link between a firm's segment reconciliation disclosure and its indebtedness. Therefore, firms with high leverage should be more likely to have segment-level earnings that do not equal firm-level earnings.

**Financial Analyst Following**

Prior research shows that managers have incentives to increase the visibility of their firms' securities (Merton, 1987; Fishman & Hagerty, 1989; Diamond & Verrecchia, 1991). If financial analysts influence managers' reporting decisions, then managers should be more inclined to report segment reconciliations so that the firm's segment information is more transparent, this should result in aggregated segment earnings different from firm-level earnings. The expectation of SFAS No. 131, of which analysts were the primary proponent, was to increase transparency by providing information through insiders' eyes (i.e., the management approach to segment disclosure). If one expects that segment financial information reported under the management approach differs from traditional GAAP financial measurements used at the firm level for annual reports, then firms with a high analyst following are more likely to report a segment reconciliation in hopes of improving transparency of the firm to financial analysts. This potentially implies that providing segment information from a "management approach" would generate some differences from the firm-level earnings information that should prove beneficial to financial analysts.

**Number of Segments Reported**

Since segment reconciliations exist only in firms with reportable segments, it is reasonable to consider the number of segments in firms as one of the determinants that affect management reporting behavior. Givoly et al. (1999) find that the measurement errors in segment information are larger than in those with fewer reportable segments. Therefore, the firms with more segments have the capability to report segment-level earnings equal to, greater than, or less than firm-level earnings. In such firms, management also possesses a better capability to release more "insider" information, because they have more flexibility to do so. Additionally, the number of segments provides insights as to firm complexity (e.g., Bhushan, 1989; Berger & Ofek, 1995; Comment & Jarrell, 1995; Servaes, 1996; Dunn & Nathan, 1998). Firms with greater complexity may be more inclined to avoid disclosure of segment reconciliations, using, among many possibilities, unallocated resources and intercompany transfers, to ensure that aggregated segment earnings are equal to firm-level earnings.

**Herfindahl Index**

The Herfindahl Index (HERF) is used to control for differential levels of industry concentration and industry competition (Rhoades, 1993). HERF is measured as the sum of the squares of each firm's net sales divided by the sum of net sales for all firms in its respective industry (Harris, 1998). As competition increases in any particular industry, managers may be less inclined to report segment reconciliations to limit incremental information from being released to market participants. Therefore, to avoid segment disclosure, these firms would have to use their discretion to make aggregated segment earnings equal to firm-level earnings.

**Additional Determinant Variables**

Additional control variables utilized in this study include: firm size (SIZE), market-to-book (MB), total aggregated segment earnings (AGSEG), earnings volatility (EARN_VOL), and the industry-adjusted return on sales (ROS). Firm size could influence segment reporting decisions in conflicting ways. SFAS No. 131 requires disclosure only if the resulting segment would constitute at least 10 percent of consolidated values. If the size of a segment in a given firm is typically below 10 percent of the size of the firm, segment disclosure of the business is

less likely. This effect creates a positive association between firm size and the aggregation of line-of-business data. However, an opposing (and likely larger) effect is that bigger firms tend to operate in more lines-of-business and, therefore, are more likely to report additional segments. Moreover, firm size can be viewed as a proxy for litigation risk because larger firms have more assets and are, therefore, more likely to be targets of litigation (Kasznik & Lev, 1995). This would lead to a negative association between size and the aggregation of different activities, which is consistent with prior findings that size is associated with a greater level of disclosure (e.g., Lang & Lundholm, 1993). Furthermore, larger firms have greater analyst following. As mentioned earlier, analysts equate more detailed segment disclosure with increased financial reporting transparency and, therefore, managers who desire to be evaluated in a favorable light will tend to disaggregate segment information more.

This study includes market-to-book ratio (MB) to control for growth opportunities and aggregated segment earnings (AGSEG) to control for the level of segment earnings disclosure. Since the firms may use segment reporting to smooth earnings, this study controls for earnings volatility (EARN_VOL). It is possible that firms with high earnings volatility will have strong incentives to report segment-level earnings equal to firm-level earnings in order to avoid disclosure of segments with unstable earnings streams. The industry-adjusted return on sales (ROS) is included in the model to control for overall industry profitability.

## DATA AND EMPIRICAL FINDINGS

### Data

The sample selection process begins with Annual Compustat data collected from the Compustat Segment and Annual Industrial and Research files for 1999–2006. Firms included in the sample must meet the following criteria: (1) firms covered in IBES; (2) firms with no mergers or acquisitions; (3) firms with no missing values, across all variables; (4) firms with no missing values for segment earnings in the Compustat Segment database; (5) firms not in financial services industries; (6) segments not entitled "Corporate"; (7) segments classified as business segments; and (8) firms with no missing CRSP data. Following the industry classification of Fama and French (1997), this study deletes industries classified as financial institutions because their required reporting disclosure differs significantly from other industries. This sample selection criterion yields a final sample size of 1,202 firms and 3,858 firm year observations for 1999–2006. Table 1 provides a summary of the sample selection procedure.

**Table 1**
**Sample Selection Criteria and Distribution**

| Full Sample | Number of Firm Year Observations | Number of Firms |
|---|---|---|
| Compustat Segment reporting 1999-2006 | 44,448 | 9,601 |
| Less: Multiple segment firms | 34,348 | 7,153 |
| Less: IBES annual earnings forecasts | 2,581 | 608 |
| **Subtotal** | **7,519** | **1,840** |
| Less: financial industries | 591 | 169 |
| Less: mergers and acquisitions | 2,088 | 201 |
| Less: observations with missing variable values | 982 | 268 |
| **Total (Final Sample 1999-2006)** | **3,858** | **1,202** |

*This table reports our sample selection procedures. We start with the Compustat Segment reporting file. Firm year observations will be excluded if the (latest) analysts' annual earnings forecast is missing in IBES. We end up with 7,519 firm year observations for years 1999 – 2006 (1,840 firms). We next delete financial industries and observations with mergers and acquisitions. Finally, we require the observations to have all the financial variables. Our final sample includes 3,858 firm year observations for years 1999-2006 (1,202 firms).

### Empirical Findings

Table 2 presents the descriptive statistics for the sample firms used in this study. Columns to the far right of Table 2 present t-statistics for the means of all variables. Firms with SER≠0 and SER=0 are compared in Panel A.

All variables in the full sample have significant means except for earnings volatility. When SER=0, all variables have significant means expect for firm-level return on sales, market-to-book, and return on assets. For firms with SER≠0, all variables have significant means with the exception of earnings volatility. The mean of SER is significantly negative for the full sample, which suggests, on average, that firms are more likely to report aggregated segment-level earnings greater than the firm-level earnings. Firms with SER=0 are significantly larger and are in more competitive industries. Firms with SER≠0 have a significantly greater return on sales, higher leverage, higher analyst following, and more growth.

While the tests for the full sample of SER and non-SER disclosers provide initial results, we expect that the results should be more apparent for positive versus negative segment reconciliations. In particular, firms with SER>0 seem to be missing some earnings items to reconcile aggregated segment earnings to consolidated earnings, while firms with SER<0 appear to be overreporting their earnings at the segment level. The overreporting of earnings may be an indicator of future earnings in the near future that GAAP does not allow recognition of at that time. Because of the possible incentives to report positive or negative SERs, we compare SER<0 to SER>0 in Panel B of Table 2.[13] When SER<0, all of the variables have significant means except for earnings volatility. When SER>0, all of the variables have significant means except for firm-level return on sales and unexpected earnings. Firms with SER>0 are classified as having an agency cost motive more often, have higher leverage, less accruals, are smaller, and are classified as loss firms more often. Consistent with Berger and Hann (2007), the agency cost motive finding suggests managers may be hiding abnormal profits. The finding for firms with losses suggests that firms could be reporting SER>0 to conceal losses since these firms also have higher agency costs. Firms with SER<0 have significantly greater earnings, are larger, have greater analyst following, have greater aggregated segment earnings, have higher ROA, and have a Big N auditor more often. Our findings here suggest that firms that report their aggregated segment earnings greater than firm-level earnings may be under greater scrutiny since the firms are larger, more profitable, and more closely followed by analysts. They are also more likely to be audited by a major audit firm.

Table 3 reports the sample distribution by industry (Panel A) and by year (Panel B). As shown in panel A of Table 3, the following five industries comprise 30% of the full sample: utilities, machinery, business services, chemicals, and telecommunications. In these five industries, 56% of the firms report SER<0. Every industry in our sample reports more firms with SER≠0 (e.g. SER<0 or SER>0) compared to SER=0. The Herfindahl Index indicates that the five most competitive industries in our sample are: utilities, chemicals, machinery, business services, and electronic equipment. Their respective index values are 0.002, 0.004, 0.004, 0.005, and 0.006. It should be noted that all five industries report a significantly larger number of firms reporting SER<0. In Panel B of Table 3, firm year observations are fairly distributed for the full sample and throughout the sample time frame, showing a slight decrease in 2006. From 2002 to 2005, the number of firms reporting SER>0 has been increasing. On the other hand, from 2003 to 2006, the number of firms reporting SER<0 has been steadily decreasing. This finding does suggest that there is a shift in managers' segment reporting choices over time, which could be a function of their business or the economic conditions, or combination of both.

Table 4 presents Pearson/Spearman correlation coefficients for the variables used in our analysis with Pearson coefficients in the upper diagonal and Spearman coefficients in the lower diagonal.[14] The Pearson correlation between EARN and AGSEG is positive and significant (.8853, p-value <.0001), which is expected given that EARN is decomposed into the AGSEG and SER components, with AGSEG being the significantly larger component of earnings. AGSEG is negative and significantly correlated with firm losses (-.4669, p-value <.0001). ROA is positive and significantly correlated with EARN and AGSEG (.8055, .7556), respectively, with p-values <.0001. These correlations are expected since ROA is constructed with net income and income before extraordinary items, respectively.

[13] Untabulated results show that firms are consistent in their reporting of SERs as consistently positive or negative and very rarely change from positive to negative, or vice versa, from year to year over the period 1999–2006.

[14] Tests of multicollinearity using the Variance Inflation Factor (VIF) show that multicollinearity does not pose a problem since all VIFs are below 2.9.

**Table 2**
**Descriptive Statistics (1999-2006)**

**Panel A: Descriptive Statistics for Full Sample, SER=0 and SER≠0**

| | Full Sample No. of Observations: 3,858 | | | | SER=0 No. of Observations: 367 | | | | SER≠0 No. of Observations: 3,491 | | | | SER=0 minus SER≠0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Mean** | **Std Dev** | **Median** | **t Value** | **Mean** | **Std Dev** | **Median** | **t Value** | **Mean** | **Std Dev** | **Median** | **t Value** | **Mean** | **Pr>\|t\|** |
| **AGENCY** | 0.455 | 0.498 | 0.000 | 56.790 | 0.480 | 0.500 | 0.000 | 18.360 | 0.453 | 0.498 | 0.000 | 53.750 | 0.027 | 0.688 |
| **EARN** | 0.071 | 0.152 | 0.078 | 28.850 | 0.068 | 0.319 | 0.091 | 4.060 | 0.071 | 0.122 | 0.077 | 34.370 | -0.003 | 0.688 |
| **SER** | -0.010 | 0.078 | -0.004 | -8.330 | 0.000 | 0.000 | 0.000 | . | -0.012 | 0.082 | -0.007 | -8.340 | 0.012 | 0.007 |
| **ROS** | 0.100 | 1.154 | 0.045 | 5.390 | 0.061 | 0.966 | 0.062 | 1.220 | 0.104 | 1.172 | 0.044 | 5.250 | -0.043 | 0.007 |
| **NSEG** | 3.126 | 1.244 | 3.000 | 156.100 | 2.891 | 1.083 | 3.000 | 51.120 | 3.150 | 1.257 | 3.000 | 148.090 | -0.259 | 0.329 |
| **ACC** | -0.060 | 0.102 | -0.049 | -36.840 | -0.042 | 0.065 | -0.039 | -12.380 | -0.062 | 0.104 | -0.050 | -35.150 | 0.02 | 0.500 |
| **SIZE** | 6.889 | 1.936 | 6.871 | 220.970 | 6.546 | 1.910 | 6.546 | 65.660 | 6.925 | 1.936 | 6.892 | 211.350 | -0.379 | 0.000 |
| **LEV** | 0.218 | 0.172 | 0.202 | 78.800 | 0.190 | 0.172 | 0.157 | 21.090 | 0.221 | 0.172 | 0.205 | 76.120 | -0.031 | 0.000 |
| **FOL** | 8.458 | 7.884 | 6.000 | 66.630 | 7.981 | 7.089 | 6.000 | 21.570 | 8.508 | 7.963 | 6.000 | 63.130 | -0.527 | 0.000 |
| **MB** | 2.855 | 20.376 | 1.896 | 8.700 | 1.685 | 21.698 | 2.023 | 1.490 | 2.979 | 20.231 | 1.878 | 8.700 | -1.294 | 0.001 |
| **LOSS** | 0.111 | 0.314 | 0.000 | 21.910 | 0.087 | 0.283 | 0.000 | 5.910 | 0.113 | 0.317 | 0.000 | 21.100 | -0.026 | 0.223 |
| **AGSEG** | 0.081 | 0.167 | 0.087 | 30.170 | 0.068 | 0.319 | 0.091 | 4.060 | 0.082 | 0.142 | 0.087 | 34.380 | -0.014 | 0.247 |
| **EARN_VOL** | 6.387 | 249.569 | 0.700 | 1.590 | 1.518 | 3.133 | 0.511 | 9.280 | 6.898 | 262.355 | 0.729 | 1.550 | -5.38 | 0.132 |
| **ROA** | 0.012 | 0.357 | 0.040 | 2.050 | -0.021 | 0.967 | 0.055 | -0.430 | 0.015 | 0.207 | 0.039 | 4.370 | -0.036 | 0.104 |
| **BIG N** | 0.959 | 0.198 | 1.000 | 300.540 | 0.946 | 0.227 | 1.000 | 79.690 | 0.960 | 0.195 | 1.000 | 291.200 | -0.014 | 0.695 |
| **HERF** | 0.034 | 0.128 | 0.001 | 16.420 | 0.028 | 0.126 | 0.000 | 4.190 | 0.035 | 0.128 | 0.001 | 15.900 | -0.007 | 0.061 |
| **UE** | 0.010 | 0.081 | 0.008 | 6.950 | 0.013 | 0.076 | 0.012 | 2.910 | 0.009 | 0.081 | 0.007 | 6.390 | 0.004 | 0.081 |

**AGENCY** equals 1 if the firm is classified as having an agency motive, 0 otherwise. **EARN** is firm level operating income after depreciation scaled by total assets (Item #178 / Item#6) in year t. **SER** is the difference between firm level operating income after depreciation (Item #178) and sum of segment operating profits (Item OPS), scaled by total assets in year t. **ROS** is the Fama French (1997) industry-adjusted return on sales (Item #178/Item #6). **NSEG** is the number of segments in firms. **ACC** is the firm level accruals which is the difference between income before extraordinary items (Item#18) and operating cash flows (Item#308) divided by total assets, measured in the year immediately prior to the forecasted year (magnitude of accruals). **SIZE** is the natural log of market value of equity. **LEV** is the total debt over total assets (Item #9 / Item #6). **FOL** is number of analyst following in year t. **MB** is the market to book ratio (Item #199 * Item #25 / Item #60). **LOSS** equals 1 if firm level operating income (Item #178) is negative, 0 otherwise. **AGSEG** is the aggregated segment operating profits (Item OPS) in year t. **EARN_VOL** is the earnings volatility, measured as the absolute value of the standard deviation of EPS over last 5 years (plus current year) scaled by the average EPS over the same period. **ROA** is net income(loss) over total operating assets [Item #172 / (Item #6-Item#1)]. **BIG N** equals 1 if firm's auditor is a Big N auditor, 0 otherwise. **HERF** is the sum of the squares of each firm's net sales divided by the sum of net sales for all firms in its respective industry. **UE** is (Item#178) in year t minus (Item#178) in year t-1 scaled by (Item#6).

**Table 2 (cont.)**
**Descriptive Statistics (1999-2006)**

**Panel B: Descriptive Statistics for SER<0 and SER>0**

| | SER≠0 No. of Observations: 3,491 | | | | SER<0 No. of Observations: 2,402 | | | | SER>0 No. of Observations: 1,089 | | | | SER<0 minus SER>0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Mean** | **Std Dev** | **Median** | **t Value** | **Mean** | **Std Dev** | **Median** | **t Value** | **Mean** | **Std Dev** | **Median** | **t Value** | **Mean** | **Pr>\|t\|** |
| **AGENCY** | 0.453 | 0.498 | 0.000 | 53.750 | 0.381 | 0.486 | 0.000 | 38.400 | 0.612 | 0.487 | 1.000 | 41.470 | -0.231 | 0.004 |
| **EARN** | 0.071 | 0.122 | 0.077 | 34.370 | 0.075 | 0.124 | 0.080 | 29.500 | 0.062 | 0.116 | 0.071 | 17.720 | 0.013 | <.0001 |
| **SER** | -0.012 | 0.082 | -0.007 | -8.340 | -0.032 | 0.070 | -0.015 | -22.160 | 0.033 | 0.087 | 0.010 | 12.680 | -0.065 | <.0001 |
| **ROS** | 0.104 | 1.172 | 0.044 | 5.250 | 0.121 | 0.547 | 0.043 | 10.850 | 0.067 | 1.934 | 0.047 | 1.140 | 0.054 | 0.205 |
| **NSEG** | 3.150 | 1.257 | 3.000 | 148.090 | 3.137 | 1.247 | 3.000 | 123.360 | 3.179 | 1.280 | 3.000 | 81.970 | -0.042 | 0.364 |
| **ACC** | -0.062 | 0.104 | -0.050 | -35.150 | -0.053 | 0.092 | -0.047 | -28.390 | -0.082 | 0.126 | -0.057 | -21.520 | 0.029 | <.0001 |
| **SIZE** | 6.925 | 1.936 | 6.892 | 211.350 | 6.962 | 1.886 | 6.892 | 180.940 | 6.842 | 2.041 | 6.889 | 110.650 | 0.12 | 0.089 |
| **LEV** | 0.221 | 0.172 | 0.205 | 76.120 | 0.216 | 0.167 | 0.199 | 63.410 | 0.233 | 0.181 | 0.225 | 42.340 | -0.017 | 0.010 |
| **FOL** | 8.508 | 7.963 | 6.000 | 63.130 | 8.733 | 8.025 | 6.000 | 53.330 | 8.012 | 7.803 | 6.000 | 33.880 | 0.721 | 0.013 |
| **MB** | 2.979 | 20.231 | 1.878 | 8.700 | 2.943 | 18.705 | 1.926 | 7.710 | 3.056 | 23.256 | 1.784 | 4.340 | -0.113 | 0.879 |
| **LOSS** | 0.113 | 0.317 | 0.000 | 21.100 | 0.104 | 0.305 | 0.000 | 16.700 | 0.133 | 0.340 | 0.000 | 12.930 | -0.029 | 0.012 |
| **AGSEG** | 0.082 | 0.142 | 0.087 | 34.380 | 0.107 | 0.123 | 0.101 | 42.570 | 0.029 | 0.164 | 0.056 | 5.820 | 0.078 | <.0001 |
| **EARN_VOL** | 6.898 | 262.355 | 0.729 | 1.550 | 8.810 | 316.237 | 0.698 | 1.370 | 2.682 | 8.332 | 0.816 | 10.620 | 6.128 | 0.523 |
| **ROA** | 0.015 | 0.207 | 0.039 | 4.370 | 0.030 | 0.198 | 0.045 | 7.430 | -0.017 | 0.222 | 0.027 | -2.560 | 0.047 | <.0001 |
| **BIG N** | 0.960 | 0.195 | 1.000 | 291.200 | 0.967 | 0.179 | 1.000 | 263.990 | 0.947 | 0.225 | 1.000 | 139.070 | 0.02 | 0.005 |
| **HERF** | 0.035 | 0.128 | 0.001 | 15.900 | 0.036 | 0.132 | 0.001 | 13.220 | 0.032 | 0.120 | 0.000 | 8.840 | 0.004 | 0.475 |
| **UE** | 0.009 | 0.081 | 0.007 | 6.390 | 0.013 | 0.084 | 0.009 | 7.230 | 0.001 | 0.073 | 0.003 | 0.320 | 0.012 | 0.081 |

**AGENCY** equals 1 if the firm is classified as having an agency motive, 0 otherwise (by design these classified have proprietary cost motives). **EARN** is firm level operating income after depreciation scaled by total assets (Item #178 / Item#6) in year t. **SER** is the difference between firm level operating income after depreciation (Item #178) and sum of segment operating profits (Item OPS), scaled by total assets in year t. **ROS** is the Fama French (1997) industry-adjusted return on sales (Item #178/Item #6). **NSEG** is the number of segments in firms. **ACC** is the firm level accruals which is the difference between income before extraordinary items (Item#18) and operating cash flows (Item#308) divided by total assets, measured in the year immediately prior to the forecasted year (magnitude of accruals). **SIZE** is the natural log of market value of equity. **LEV** is the total debt over total assets (Item #9 / Item #6). **FOL** is number of analyst following in year t. **MB** is the market to book ratio (Item #199 * Item #25 / Item #60). **LOSS** equals 1 if firm level operating income (Item #178) is negative, 0 otherwise. **AGSEG** is the aggregated segment operating profits (Item OPS) in year t. **EARN_VOL** is the earnings volatility, measured as the absolute value of the standard deviation of EPS over last 5 years (plus current year) scaled by the average EPS over the same period. **ROA** is net income(loss) over total operating assets [Item #172 / (Item #6-Item#1)]. **BIG N** equals 1 if firm's auditor is a Big N auditor, 0 otherwise. **HERF** is the sum of the squares of each firm's net sales divided by the sum of net sales for all firms in its respective industry. **UE** is (Item#178) in year t minus (Item#178) in year t-1 scaled by (Item#6).

 

**Table 3**
**Industry Classifications and Fiscal Year Distributions for Sample Firms**
**Panel A: Industry Classifications for Sample Firms**

| Industry Name | SER=0 | % | SER>0 | % | SER<0 | % | Full Sample | % | HERF |
|---|---|---|---|---|---|---|---|---|---|
| Agriculture | 3 | 1% | 3 | 0% | 2 | 0% | 8 | 0% | 0.838 |
| Food Products | 3 | 1% | 47 | 2% | 25 | 2% | 75 | 2% | 0.026 |
| Candy & Soda | 0 | 0% | 6 | 0% | 0 | 0% | 6 | 0% | 1 |
| Alcoholic Beverages | 3 | 1% | 5 | 0% | 5 | 0% | 13 | 0% | 0.448 |
| Tobacco Products | 0 | 0% | 11 | 0% | 2 | 0% | 13 | 0% | 0.524 |
| Recreational Products | 0 | 0% | 26 | 1% | 8 | 1% | 34 | 1% | 0.184 |
| Entertainment | 1 | 0% | 17 | 1% | 9 | 1% | 27 | 1% | 0.127 |
| Printing & Publishing | 4 | 1% | 59 | 2% | 13 | 1% | 76 | 2% | 0.019 |
| Consumer Goods | 6 | 2% | 40 | 2% | 34 | 3% | 80 | 2% | 0.028 |
| Apparel | 18 | 5% | 44 | 2% | 19 | 2% | 81 | 2% | 0.018 |
| Healthcare | 4 | 1% | 23 | 1% | 9 | 1% | 36 | 1% | 0.091 |
| Medical Equipment | 19 | 5% | 48 | 2% | 24 | 2% | 91 | 2% | 0.031 |
| Pharmaceutical Products | 7 | 2% | 47 | 2% | 23 | 2% | 77 | 2% | 0.051 |
| Chemicals | 10 | 3% | 134 | 6% | 68 | 6% | 212 | 5% | 0.004 |
| Rubber & Plastic Prod. | 3 | 1% | 39 | 2% | 13 | 1% | 55 | 1% | 0.05 |
| Textiles | 5 | 1% | 26 | 1% | 12 | 1% | 43 | 1% | 0.072 |
| Construction Materials | 12 | 3% | 103 | 4% | 35 | 3% | 150 | 4% | 0.009 |
| Construction | 3 | 1% | 29 | 1% | 17 | 2% | 49 | 1% | 0.061 |
| Steel Works | 11 | 3% | 102 | 4% | 40 | 4% | 153 | 4% | 0.01 |
| Fabricated Products | 0 | 0% | 6 | 0% | 2 | 0% | 8 | 0% | 0.316 |
| Machinery | 21 | 6% | 135 | 6% | 81 | 7% | 237 | 6% | 0.004 |
| Electrical Equipment | 14 | 4% | 70 | 3% | 21 | 2% | 105 | 3% | 0.035 |
| Automobiles & Trucks | 17 | 5% | 60 | 2% | 50 | 5% | 127 | 3% | 0.019 |
| Aircraft | 2 | 1% | 40 | 2% | 8 | 1% | 50 | 1% | 0.074 |
| Shipbuilding & Railroad | 2 | 1% | 22 | 1% | 3 | 0% | 27 | 1% | 0.129 |
| Defense | 0 | 0% | 10 | 0% | 2 | 0% | 12 | 0% | 0.649 |
| Precious Metals | 0 | 0% | 11 | 0% | 2 | 0% | 13 | 0% | 0.318 |
| Nonmetallic Mining | 3 | 1% | 22 | 1% | 5 | 0% | 30 | 1% | 0.151 |
| Coal | 0 | 0% | 4 | 0% | 5 | 0% | 9 | 0% | 0.546 |
| Petroleum & Natural Gas | 6 | 2% | 145 | 6% | 29 | 3% | 180 | 5% | 0.012 |
| Utilities | 41 | 11% | 127 | 5% | 119 | 11% | 287 | 7% | 0.002 |
| Telecommunications | 12 | 3% | 115 | 5% | 67 | 6% | 194 | 5% | 0.009 |
| Personal Services | 5 | 1% | 34 | 1% | 6 | 1% | 45 | 1% | 0.067 |
| Business Services | 25 | 7% | 137 | 6% | 64 | 6% | 226 | 6% | 0.005 |
| Computers | 8 | 2% | 50 | 2% | 20 | 2% | 78 | 2% | 0.044 |
| Electronic Equipment | 20 | 5% | 122 | 5% | 47 | 4% | 189 | 5% | 0.006 |
| Measuring & Control | 11 | 3% | 44 | 2% | 35 | 3% | 90 | 2% | 0.022 |
| Business Supplies | 12 | 3% | 73 | 3% | 47 | 4% | 132 | 3% | 0.009 |
| Shipping Containers | 4 | 1% | 19 | 1% | 7 | 1% | 30 | 1% | 0.09 |
| Transportation | 14 | 4% | 78 | 3% | 35 | 3% | 127 | 3% | 0.018 |
| Wholesale | 18 | 5% | 125 | 5% | 28 | 3% | 171 | 4% | 0.01 |
| Retail | 17 | 5% | 104 | 4% | 34 | 3% | 155 | 4% | 0.009 |
| Restaurants, Hotel, Motel | 3 | 1% | 40 | 2% | 14 | 1% | 57 | 1% | 0.06 |
| **TOTAL** | **367** | | **2,402** | | **1,089** | | **3,858** | | |

*The table above reports the industry distribution for our final sample (3,858 firm year observations 1999-2006) based on the Fama and French (1997) industry classification. Firms with SIC codes between 6000-6411 or 6500-6999 are excluded from our sample since those are financial institutions, insurance and real estate. The Herfindahl Index is defined as the sum of the squares of each firm's net sales divided by the sum of net sales for all firms in its respective industry.

**Table 3 Continued**

**Panel B: Fiscal Year Distributions for Sample Firms**

| Fiscal Year | SER=0 (Frequency) | SER>0 (Frequency) | SER<0 (Frequency) | Full Sample (Frequency) |
|---|---|---|---|---|
| **1999** | 61 | 265 | 125 | 451 |
| **2000** | 54 | 283 | 117 | 454 |
| **2001** | 54 | 253 | 156 | 463 |
| **2002** | 51 | 300 | 143 | 494 |
| **2003** | 42 | 313 | 165 | 520 |
| **2004** | 37 | 341 | 143 | 521 |
| **2005** | 42 | 345 | 142 | 529 |
| **2006** | 26 | 302 | 98 | 426 |

*The table above reports the fiscal year distribution for our final sample (3,858 firm year observations 1999-2006).

Although not the primary focus of this study, we provide a test (Model 1) to determine the market significance of SERs. Table 5 provides evidence that SERs are significantly positive, value relevant, and that these segment reconciliation differences do matter to the capital markets. These findings support the necessity to determine factors that may affect managers segment reporting choices. SER has a significantly positive association with the market value of the firm. This suggests that segment reconciliations increase as the market value increases. However, the interaction term of SER and UE is significantly negative, which suggests that firm value decreases when unexpected earnings are accompanied by a segment reconciliation. These results are consistent with those of Hollie and Yu (2010), who find that the market not only prices but also, in some cases, misprices the persistence of SERs, especially when SER>0. This study shows later in the paper that these same firms generally have higher agency costs than firms with negative SERs.

The study estimates a logistic model (Model 2) to identify the factors for a firm's decision of whether or not managers report aggregated segment-level earnings different from their consolidated firm-level earnings. The first model estimates the factors for SER=0 and SER≠0 and is presented in Table 6. The coefficient on AGENCY, our variable of interest, is significantly negative, suggesting that firms that have high agency costs are more likely to report aggregated segment earnings equal to firm-level earnings and, thereby, do not provide a segment reconciliation. This is consistent with our prediction that firms with high agency costs will be more likely to avoid detailed segment disclosure so as to not reveal segments with abnormally low profits, cross-subsidization of poorly performing segments from the excess funds of better performing segments, or inefficient segment transfers. Since Agency has a value of 1 if the firm is classified as having an agency motive, 0 otherwise (by design these are classified as having proprietary cost motives, these results also suggest that firms that have high proprietary costs are more likely to report SER≠0, and, thereby, provide a segment reconciliation. This is consistent with the findings of Darrough and Stoughton (1990), who predict that firms in more competitive industries will follow better disclosure policies. Specifically, the authors predict that in industries with low entry costs, potential entrants could interpret withholding information as possible future good news about the industry due to expected positive shocks to product demand. In the context of segment disclosure, this means that potential entrants could view nondisclosure of segment reconciliations as firms reporting SER=0 in order to avoid disclosure and hide segments with abnormally high profits.

In Table 6, the coefficients on NSEG, SIZE, LEV, LOSS, and EARN_VOL are significantly positive, suggesting that firms with a greater number of reported segments, larger firms, and firms with losses, higher leverage, or higher earnings volatility are more likely to report SER≠0. Firms with more segments are more likely to have more allocation issues, be more decentralized, and have more imprecise industry definitions (Givoly et al., 1999), which may provide additional opportunities for reporting differences between "management approach" segment earnings reported versus that of consolidated GAAP earnings reported at the firm level. The expected negatively significant coefficient on LOSS could be consistent with the notion that firms are using the flexibility provided by the *management approach* under SFAS No. 131 to lessen the impact of losses at the firm level by reporting aggregated segments greater than firm earnings. Firms that experience a loss are twice as likely to report SER≠0, as are firms that do not report a loss at the firm level. The positive coefficient on leverage is consistent with our expectations since segment disclosure information is important to creditors to allow them to evaluate risk correctly. Therefore, if firms with high leverage report segment-level earnings that do not equal firm-level earnings, they will be required to disclose a segment reconciliation.

**Table 4**
**Pearson/Spearman Correlation Table**

| | EARN | SER | AGENCY | ROS | NSEG | ACC | SIZE | LEV | FOL | MB | LOSS | AGSEG | EARN_VOL | ROA | BIG N | HERF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EARN** | | 0.0554 | -0.2403 | 0.3485 | 0.0326 | 0.2626 | 0.2631 | 0.0415 | 0.1322 | 0.2316 | -0.5200 | 0.8853 | -0.0024 | 0.8055 | 0.0169 | 0.0585 |
| | | 0.0006 | <.0001 | <.0001 | 0.0427 | <.0001 | <.0001 | 0.0099 | <.0001 | <.0001 | <.0001 | <.0001 | 0.8810 | <.0001 | 0.2939 | 0.0003 |
| **SER** | -0.0653 | | 0.1439 | 0.0177 | 0.0217 | -0.2871 | -0.0009 | 0.0747 | 0.0078 | -0.0067 | -0.0148 | -0.4153 | 0.0014 | -0.0467 | 0.0250 | 0.0125 |
| | <.0001 | | <.0001 | 0.2721 | 0.1781 | <.0001 | 0.9534 | <.0001 | 0.6277 | 0.6756 | 0.3593 | <.0001 | 0.9287 | 0.0037 | 0.1201 | 0.4386 |
| **AGENCY** | -0.3326 | 0.2347 | | -0.0418 | 0.2646 | -0.1777 | -0.0780 | 0.0012 | -0.0165 | -0.0108 | 0.2862 | -0.2860 | -0.0138 | -0.1594 | -0.0343 | -0.0043 |
| | <.0001 | <.0001 | | 0.0094 | <.0001 | <.0001 | <.0001 | 0.9390 | 0.3059 | 0.5016 | <.0001 | <.0001 | 0.3906 | <.0001 | 0.0334 | 0.7887 |
| **ROS** | 0.4426 | 0.0228 | -0.1183 | | 0.0368 | 0.0478 | 0.0811 | 0.0345 | 0.0436 | 0.0696 | -0.1260 | 0.3093 | -0.0011 | 0.3555 | -0.0035 | 0.0125 |
| | <.0001 | 0.1562 | <.0001 | | 0.0223 | 0.0030 | <.0001 | 0.0322 | 0.0067 | <.0001 | <.0001 | <.0001 | 0.9478 | <.0001 | 0.8272 | 0.4375 |
| **NSEG** | -0.0317 | 0.0304 | 0.2503 | -0.0019 | | 0.0509 | 0.3369 | 0.0478 | 0.1164 | 0.0164 | -0.1048 | 0.0196 | 0.0111 | 0.0445 | 0.0672 | 0.1481 |
| | 0.0489 | 0.0593 | <.0001 | 0.9061 | | 0.0016 | <.0001 | 0.0030 | <.0001 | 0.3089 | <.0001 | 0.2227 | 0.4901 | 0.0057 | <.0001 | <.0001 |
| **ACC** | 0.1550 | -0.0792 | -0.1518 | 0.0509 | 0.0255 | | 0.1528 | -0.0436 | 0.0182 | 0.0164 | -0.3100 | 0.3730 | -0.0013 | 0.3316 | -0.0028 | 0.0091 |
| | <.0001 | <.0001 | <.0001 | 0.0016 | 0.1136 | | <.0001 | 0.0067 | 0.2584 | 0.3101 | <.0001 | <.0001 | 0.9350 | <.0001 | 0.8617 | 0.5729 |
| **SIZE** | 0.3245 | 0.0279 | -0.0904 | 0.2277 | 0.3064 | 0.1024 | | -0.0482 | 0.5692 | 0.0515 | -0.3172 | 0.2401 | 0.0228 | 0.1870 | 0.1853 | 0.2196 |
| | <.0001 | 0.0837 | <.0001 | <.0001 | <.0001 | <.0001 | | 0.0027 | <.0001 | 0.0014 | <.0001 | <.0001 | 0.1571 | <.0001 | <.0001 | <.0001 |
| **LEV** | -0.0928 | 0.0679 | -0.0186 | -0.0791 | 0.0812 | -0.0363 | 0.0129 | | -0.0253 | 0.0405 | -0.0916 | 0.0031 | 0.0077 | 0.0049 | 0.0466 | 0.0257 |
| | <.0001 | <.0001 | 0.2474 | <.0001 | <.0001 | 0.0240 | 0.4241 | | 0.1164 | 0.0119 | <.0001 | 0.8499 | 0.6319 | 0.7601 | 0.0038 | 0.1111 |
| **FOL** | 0.2233 | -0.0017 | -0.0606 | 0.1598 | 0.1292 | 0.0576 | 0.6037 | 0.0476 | | 0.0189 | -0.1071 | 0.1168 | 0.0122 | 0.0860 | 0.1053 | 0.0575 |
| | <.0001 | 0.9173 | 0.0002 | <.0001 | <.0001 | 0.0003 | <.0001 | 0.0031 | | 0.2395 | <.0001 | <.0001 | 0.4472 | <.0001 | <.0001 | 0.0003 |
| **MB** | 0.4161 | -0.0602 | -0.1033 | 0.2149 | 0.0175 | 0.0753 | 0.4392 | -0.1745 | 0.2850 | | -0.0179 | 0.2141 | -0.0002 | 0.1862 | 0.0068 | 0.0149 |
| | <.0001 | 0.0002 | <.0001 | <.0001 | 0.2764 | <.0001 | <.0001 | <.0001 | <.0001 | | 0.2652 | <.0001 | 0.9898 | <.0001 | 0.6735 | 0.3550 |
| **LOSS** | -0.5434 | -0.0045 | 0.2862 | -0.3064 | -0.1165 | -0.2086 | -0.3042 | -0.1233 | -0.1455 | -0.0874 | | -0.4669 | -0.0047 | -0.3604 | -0.0730 | -0.0622 |
| | <.0001 | 0.7820 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | | <.0001 | 0.7718 | <.0001 | <.0001 | 0.0001 |
| **AGSEG** | 0.8896 | -0.3941 | -0.3903 | 0.3842 | -0.0429 | 0.1690 | 0.2516 | -0.1237 | 0.1783 | 0.3870 | -0.4783 | | -0.0029 | 0.7556 | 0.0037 | 0.0475 |
| | <.0001 | <.0001 | <.0001 | <.0001 | 0.0077 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | | 0.8587 | <.0001 | 0.8162 | 0.0032 |
| **EARN_VOL** | -0.4065 | 0.0283 | 0.1726 | -0.1020 | -0.0309 | -0.1425 | -0.2584 | 0.0864 | -0.1533 | -0.2262 | 0.2513 | -0.3637 | | -0.0027 | 0.0022 | 0.1223 |
| | <.0001 | 0.0788 | <.0001 | <.0001 | 0.0553 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | | 0.8694 | 0.8901 | <.0001 |
| **ROA** | 0.8212 | -0.1417 | -0.2985 | 0.3971 | -0.0259 | 0.3001 | 0.3390 | -0.2692 | 0.1903 | 0.4209 | -0.4860 | 0.7816 | -0.3954 | | 0.0013 | 0.0267 |
| | <.0001 | <.0001 | <.0001 | <.0001 | 0.1082 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | | 0.9369 | 0.0974 |
| **BIG N** | 0.0240 | -0.0205 | -0.0343 | 0.0258 | 0.0709 | 0.0081 | 0.1772 | 0.0703 | 0.1280 | 0.0114 | -0.0730 | 0.0181 | -0.0679 | 0.0152 | | 0.0401 |
| | 0.1366 | 0.2041 | 0.0334 | 0.1098 | <.0001 | 0.6161 | <.0001 | <.0001 | <.0001 | 0.4804 | <.0001 | 0.2609 | <.0001 | 0.3456 | | 0.0127 |
| **HERF** | 0.1912 | 0.0142 | -0.0940 | 0.0277 | 0.2623 | 0.0466 | 0.5923 | 0.0781 | 0.3386 | 0.1024 | -0.2481 | 0.1403 | -0.1176 | 0.1339 | 0.1485 | |
| | <.0001 | 0.3784 | <.0001 | 0.0855 | <.0001 | 0.0038 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | <.0001 | |

*This table reports the Pearson correlation in the upper diagonal and Spearman correlation in the lower diagonal. **AGENCY** equals 1 if the firm is classified as having an agency motive, 0 otherwise (by design these classified have proprietary cost motives). **EARN** is firm level operating income after depreciation scaled by total assets (Item #178 / Item#6) in year t. **SER** is the difference between firm level operating income after depreciation (Item #178) and sum of segment operating profits (Segment Item OPS), scaled by total assets in year t. **ROS** is the Fama French (1997) industry-adjusted return on sales (Item #178/Item #6). **NSEG** is the number of segments in firms. **ACC** is the firm level accruals which is the difference between income before extraordinary items (Item#18) and operating cash flows (Item#308) divided by total assets, measured in the year immediately prior to the forecasted year (magnitude of accruals). **SIZE** is the natural log of market value of equity. **LEV** is the total debt over total assets (Item #9 / Item #6). **FOL** is number of analyst following in year t. **MB** is the market to book ratio (Item #199 * Item #25 / Item #60). **LOSS** equals 1 if firm level operating income (Item #178) is negative, 0 otherwise. **AGSEG** is the aggregated segment operating profits (Segment Item OPS) in year t. **EARN_VOL** is the earnings volatility, measured as the absolute value of the standard deviation of EPS over last 5 years (plus current year) scaled by the average EPS over the same period. **ROA** is net income (loss) over total operating assets [Annual Data Item #172 / (Item #6-Item#1)]. **BIG N** equals 1 if firm's auditor is a Big N auditor, 0 otherwise. **HERF** is the sum of the squares of each firm's net sales divided by the sum of net sales for all firms in its respective industry.

**Table 5**
**Value Relevance of Segment Reconciliation Differences**

$MVE = \gamma_0 + \gamma_1*(|SER|) + \gamma_2*(UE) + \gamma_3*(|SER|* UE) + \varepsilon$

| Variable | Parameter | Standard | t Value | Pr > \|t\| |
|---|---|---|---|---|
| **Intercept** | 1.0359 | 0.0190 | 54.65 | <.0001 |
| **\|SER\|** | 0.6339 | 0.2609 | 2.71 | 0.0068 |
| **UE** | 3.7418 | 0.2342 | 14.34 | <.0001 |
| **\|SER\|*UE** | -6.9945 | 0.9701 | -7.21 | <.0001 |

**MVE** is the market value of equity defined as common shares outstanding (Item#25) times end of fiscal year price (Item#199). **SER** is the absolute value of the difference between firm level operating income after depreciation (Item #178) and sum of segment operating profits (Segment Item OPS). **UE** is measured as operating income after depreciation (Item #178) in year t minus operating income after depreciation (Item #178) in year t-1. All variables are scaled by total assets following Brown et al. 1999.

**Table 6**
**Logistic Regression Results for Determinants of Segment Reconciliation Differences for SER = 0 and SER ≠ 0**

$SERA = \beta_0 + \beta_1*(AGENCY) + \beta_2*(ROS) + \beta_3*(NSEG) + \beta_4*(ACC) + \beta_5*(SIZE) + \beta_6*(LEV) + \beta_7*(FOL) + \beta_8*(MB) + \beta_9*(LOSS) + \beta_{10}*(AGSEG) + \beta_{11}*(EARN\_VOL) + \beta_{12}*(ROA) + \beta_{13}*(BIG\ N) + \beta_{14}*(HERF) + \varepsilon$

| Parameter | Estimate | | Standard Error | Odds Ratio Estimate | Pr > ChiSq |
|---|---|---|---|---|---|
| **INTERCEPT** | 0.3353 | | 0.3413 | | 0.3259 |
| **AGENCY** | -0.3200 | *** | 0.1239 | 0.726 | 0.0098 |
| **ROS** | -0.0358 | | 0.0772 | 0.965 | 0.6423 |
| **NSEG** | 0.1851 | *** | 0.0562 | 1.203 | 0.0010 |
| **ACC** | -2.5300 | *** | 0.6997 | 0.080 | 0.0003 |
| **SIZE** | 0.1402 | *** | 0.0416 | 1.150 | 0.0008 |
| **LEV** | 1.1297 | *** | 0.3494 | 3.095 | 0.0012 |
| **FOL** | -0.0133 | | 0.0091 | 0.987 | 0.1432 |
| **MB** | -0.0003 | | 0.0036 | 1.000 | 0.9454 |
| **LOSS** | 0.8364 | *** | 0.2412 | 2.308 | 0.0005 |
| **AGSEG** | 0.7808 | | 0.6009 | 2.183 | 0.1938 |
| **EARN_VOL** | 0.0368 | ** | 0.0175 | 1.037 | 0.0350 |
| **ROA** | 0.1230 | | 0.1888 | 1.131 | 0.5147 |
| **BIG N** | 0.1099 | | 0.2538 | 1.116 | 0.6649 |
| **HERF** | -0.2357 | | 0.4822 | 0.790 | 0.6249 |

Number of Observations: 3,858

Likelihood Ratio 80.3922 Percent Concordant 63.20

Likelihood-based Pseudo R-square: 0.00206 Max-rescaled R-Square: 0.0442

****, **, *** Significantly different from zero at the 10, 5 and 1% levels, respectively. Year and Industry dummy variables have been included.***

**SERA** equals 1 if SER≠0 and 0 if SER=0. **AGENCY** equals 1 if the firm is classified as having an agency motive, 0 otherwise (by design these classified have proprietary cost motives). **ROS** is the Fama French (1997) industry-adjusted return on sales (Item #178/Item #6). **NSEG** is the number of segments in firms. **ACC** is the firm level accruals which is the difference between income before extraordinary items (Item#18) and operating cash flows (Item#308) divided by total assets, measured in the year immediately prior to the forecasted year (magnitude of accruals). **SIZE** is the natural log of market value of equity. **LEV** is the total debt over total assets (Item #9 / Item #6). **FOL** is number of analyst following in year t. **MB** is the market to book ratio (Item #199 * Item #25 / Item #60). **LOSS** equals 1 if firm level operating income (Item #178) is negative, 0 otherwise. **AGSEG** is the aggregated segment operating profits (Segment Item OPS) in year t. **EARN_VOL** is the earnings volatility, measured as the absolute value of the standard deviation of EPS over last 5 years (plus current year) scaled by the average EPS over the same period. **ROA** is net income (loss) over total operating assets [Annual Data Item #172 / (Item #6-Item#1)]. **BIG N** equals 1 if firm's auditor is a Big N auditor, 0 otherwise. **HERF** is the sum of the squares of each firm's net sales divided by the sum of net sales for all firms in its respective industry.

 

The coefficient on ACC is significantly negative, suggesting that firms that have greater total accruals are more likely to report aggregated segment earnings equal to firm-level earnings and, therefore, not disclose a segment reconciliation. This is consistent with our expectation that firms with greater levels of accruals may have more discretion in disaggregating accruals across segments, thereby potentially using accruals to report aggregated segment-level earnings equal to firm-level earnings in order to avoid detailed disclosure of underperforming segments.

Finally, the coefficients on ROS, FOL, MB, AGSEG, ROA, BIG N, and HERF are all statistically insignificant, suggesting that return on sales, analyst following, firm growth, aggregated segment earnings, return on assets, Big N auditors, and industry competition do not significantly affect a managers' decisions to report SERs equal to zero or not. Since the Utilities industry makes up a large proportion of all SER groups, we re-estimate Model 2 without firms in this industry and the inferences remain the same.

## ADDITIONAL ANALYSIS

### Alternative Agency Cost Proxy

To further validate whether agency cost is a determinant of managers' segment reporting decisions, we use an alternative measure of agency cost defined in Hope and Thomas (2008). The authors find that managers tend to avoid disclosure of geographic segment information in order to mask greater expansion of foreign sales, lower foreign profit margins, and lower firm value in the post-SFAS No. 131 period. This measure classifies firms as nondisclosers of geographic segment information if the firm does not disclose at least two foreign segments in the first two years following the adoption of SFAS No. 131. In untabulated results, we find that inferences do not change when we use this alternative measure.

### Positive and Negative Segment Reconciliations

As shown in Figure 2, the mean segment-firm reconciliation is significantly larger in magnitude over the period 1999–2006 for firms that have a positive reconciliation (SER>0) than for firms that have a negative reconciliation (SER<0). Since we later show that firms with higher agency costs are more likely to report SER>0, this trend should be of concern to standard setters. However, we do take note of a slight decline in negative and positive SERs around the time the Sarbanes Oxley Act was being enacted. We see another notable decline in 2006. Figure 3 shows the number of firms choosing to report SER>0 is significantly larger than the number of firms reporting SER<0. Since agency costs are higher for firms with SER>0, this could be indicative of managers using their discretion in segment reporting in an opportunistic manner. Therefore, the number of firms choosing to report SER>0 should again be of concern to standard setters as it indicates that managers could be using the discretion allowed under SFAS No. 131 to disclose or not disclose segment reconciliations as well as determine the sign of the reconciliation.

To examine with the sign of the SER matters, we estimate the determinants for positive and negative segment reconciliations (SER>0 and SER<0).[15] Interestingly, the results presented in Table 7 suggest that more determinants play a role in whether a firm reports a positive or negative SER compared to the number of determinants to determine whether a firm reports an SER or not. Our variable of interest, AGENCY, is significantly positive, suggesting that firms that have high agency costs are more likely to report aggregated segment earnings less than firm-level earnings.[16] Firms in which the agency cost motive dominates are twice as likely to report SER>0 as are firms in which the agency cost motive does not dominate. One plausible explanation is that firms with high agency costs have reportable segments with abnormally low profits added up to AGSEG that are much less than the consolidated firm-level earnings (i.e., SER>0, or sum of segment earnings is less than firm-level earnings). This

[15] We exclude SER=0 firms in this in analysis since we are only interested in the determinants when SER exist along with whether the SER is positive or negative.

[16] It should be noted that the positive coefficient on AGENCY in Model 2 is not inconsistent with the negative coefficient in Model 1. Model 2 compares only those firms with SER>0 to SER<0 while excluding all firms with SER=0. Model 1 compares all firms with SER≠0 (which includes SER>0 and SER<0) to all firms with SER=0.

would suggest that SFAS No. 131 is effective in requiring firms to reveal the true internal operating performance of individual segments, especially when reportable segments have abnormally low profits.

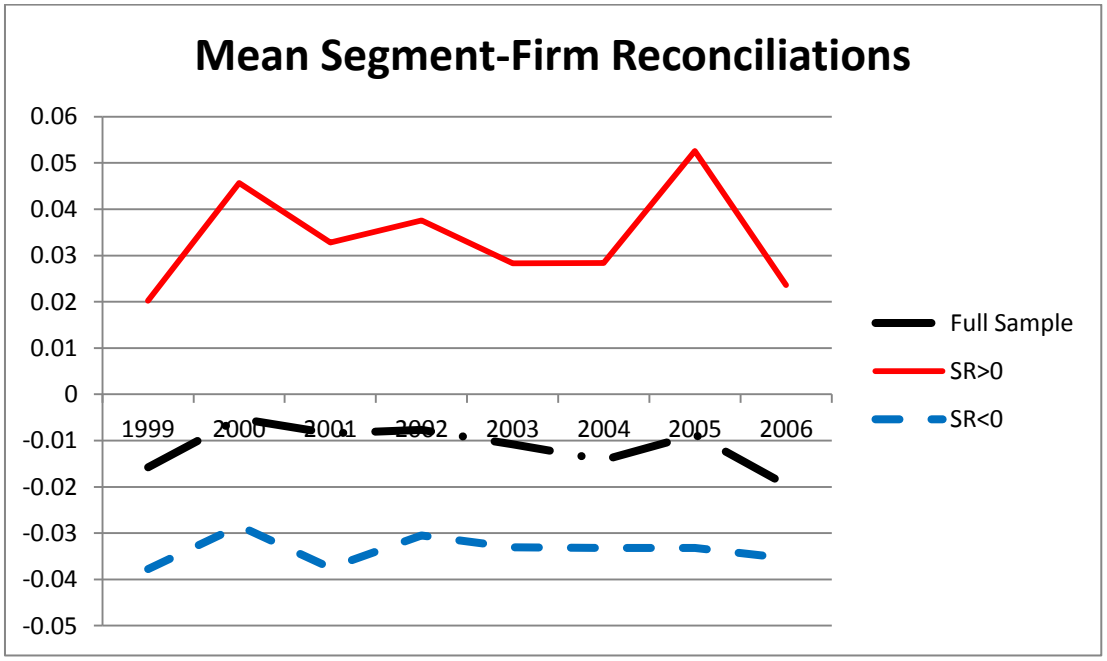


**Figure 2**

SER is the difference between firm level operating income after depreciation (Item #178) and sum of segment operating profits (Item OPS), scaled by total assets in year t. Full sample includes SER=0, SER>0 and SER<0.

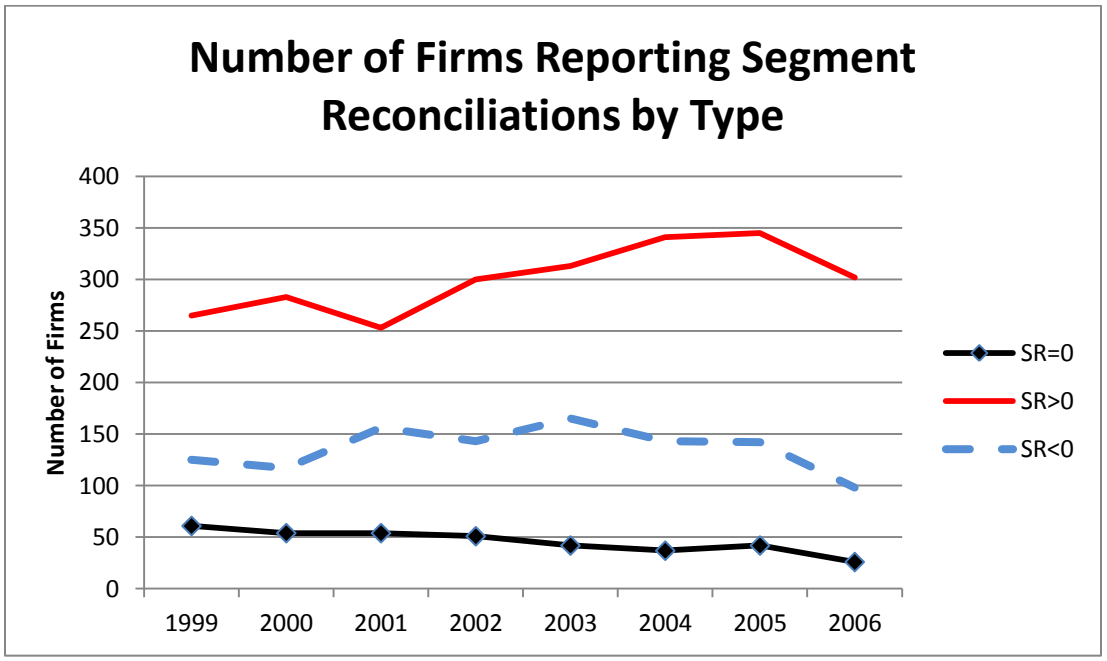


**Figure 3**

SER is the difference between firm level operating income after depreciation (Item #178) and sum of segment operating profits (Item OPS), scaled by total assets in year t.

**Table 7**
**Logistic Regression Results for Determinants of Segment Reconciliation Differences for SER < 0 and SER > 0**

$$SERB = \beta_0 + \beta_1*(AGENCY) + \beta_2*(ROS) + \beta_3*(NSEG) + \beta_4*(ACC) + \beta_5*(SIZE) + \beta_6*(LEV) + \beta_7*(FOL) + \beta_8*(MB) + \beta_9*(LOSS) + \beta_{10}*(AGSEG) + \beta_{11}*(EARN\_VOL) + \beta_{12}*(ROA) + \beta_{13}*(BIG\ N) + \beta_{14}*(HRF) + \varepsilon$$

| Parameter | Estimate | | Standard Error | Odds Ratio Estimate | Pr > ChiSq |
|---|---|---|---|---|---|
| **INTERCEPT** | -0.2257 | | 0.2595 | | 0.3844 |
| **AGENCY** | 0.6982 | *** | 0.0889 | 2.010 | <.0001 |
| **ROS** | -0.0284 | | 0.0346 | 0.972 | 0.4111 |
| **NSEG** | -0.1140 | *** | 0.0354 | 0.892 | 0.0013 |
| **ACC** | -2.8636 | *** | 0.5947 | 0.057 | <.0001 |
| **SIZE** | 0.1156 | | 0.0289 | 1.123 | <.0001 |
| **LEV** | 0.5507 | ** | 0.2426 | 1.735 | 0.0232 |
| **FOL** | -0.0156 | *** | 0.0060 | 0.984 | 0.0091 |
| **MB** | 0.0033 | | 0.0025 | 1.003 | 0.1881 |
| **LOSS** | -1.3441 | *** | 0.1777 | 0.261 | <.0001 |
| **AGSEG** | -11.1658 | *** | 0.7818 | <0.001 | <.0001 |
| **EARN_VOL** | -0.0013 | | 0.0044 | 0.999 | 0.7614 |
| **ROA** | 3.9562 | *** | 0.5378 | 52.257 | <.0001 |
| **BIG N** | -0.6338 | *** | 0.2010 | 0.531 | 0.0016 |
| **HERF** | -0.3602 | | 0.3353 | 0.698 | 0.2827 |

Number of Observations: 3,491
Likelihood Ratio 532.6293 Percent Concordant 74.80
Likelihood-based Pseudo R-square: 0.1415 Max-rescaled R-Square: 0.1990

****, **, *** Significantly different from zero at the 10, 5 and 1% levels, respectively. Year and Industry dummy variables have been included.***
**SERB** equals 1 if SER>0 and 0 if SER<0. **AGENCY** equals 1 if the firm is classified as having an agency motive, 0 otherwise (by design these classified have proprietary cost motives). **ROS** is the Fama French (1997) industry-adjusted return on sales (Item #178/Item #6). **NSEG** is the number of segments in firms. **ACC** is the firm level accruals which is the difference between income before extraordinary items (Item#18) and operating cash flows (Item#308) divided by total assets, measured in the year immediately prior to the forecasted year (magnitude of accruals). **SIZE** is the natural log of market value of equity. **LEV** is the total debt over total assets (Item #9 / Item #6). **FOL** is number of analyst following in year t. **MB** is the market to book ratio (Item #199 * Item #25 / Item #60). **LOSS** equals 1 if firm level operating income (Item #178) is negative, 0 otherwise. **AGSEG** is the aggregated segment operating profits (Segment Item OPS) in year t. **EARN_VOL** is the earnings volatility, measured as the absolute value of the standard deviation of EPS over last 5 years (plus current year) scaled by the average EPS over the same period. **ROA** is net income (loss) over total operating assets [Annual Data Item #172 / (Item #6-Item#1)]. **BIG N** equals 1 if firm's auditor is a Big N auditor, 0 otherwise. **HERF** is the sum of the squares of each firm's net sales divided by the sum of net sales for all firms in its respective industry.

In addition to the determinants shown to be significant in Table 6, we find that firm profitability and whether a firm uses a Big N auditor determines to some degree whether a firm will report a positive or negative segment reconciliation. As noted in Table 7, the coefficients on SIZE, ROA, and LEV are significantly positive, suggesting that larger firms, firms with higher ROA, and firms with higher leverage are more likely to report SER>0. For firms reporting SER>0, the manager's segment reporting choice is more driven by agency costs than SER<0 firms. The positive coefficient on ROA, which signifies that firms with greater ROA are more likely to report SER>0, suggests that managers may be attempting to protect abnormal profits by not disclosing segment earnings information that supersedes earnings reported at the firm level.

The coefficients on NSEG, ACC, FOL, LOSS, AGSEG, and BIG N are negative, suggesting that firms with a greater number of segments, greater total accruals, larger analyst following, losses, or greater aggregated segment earnings, and firms with a Big N auditor are less likely to report SER>0. The significantly negative coefficient on ACC reported in Table 6 suggests that firms are less likely to report SER≠0. However, in an isolated

case where the firm does report SER≠0, it is less likely that the firm will report the SER>0, as suggested by the negative coefficient on accruals reported in Table 7. The negative relation between analyst following and firms that report SER>0 could indicate that these firms have less external oversight from monitors such as analysts, which leads to higher agency costs at these firms. The significant coefficient on LOSS signifies firms are less likely to report SER>0. One plausible explanation is that managers may use their segment reporting discretion to show future firm profitability. In other words, at the segment level, managers might report earnings in the pipeline as revenues (or earnings) that cannot be reported in the consolidated annual report in accordance with GAAP generated earnings. The significant coefficient on BIG N shows that firms with a Big N auditor are less likely to report SER>0. However, the Big N finding is consistent with our agency finding, that firms with higher agency costs are more likely to report SER>0 but are less likely to be audited by a Big N firm. The coefficients on ROS, MB, EARN_VOL, and HERF are all statistically insignificant. Such results suggest that firm-level return on sales, growth, earnings volatility, and industry competitiveness do not significantly affect a manager's decision to report positive or negative SERs.

Given the high cost of consistently changing segment disclosure to a firm, we do not expect that firms change their segment reporting strategies often. However, to ensure that there are no systematic differences, we partition our sample into "always negative SERs" and "always positive SERs" sub-samples to examine if there are systematic differences in segment reconciliations and firm characteristics across these sub-samples. In untabulated results, we find that the majority of firms are consistent in their reporting of "always negative SERs" or "always positive SERs" and none of our inferences change when imposing this restriction.

We also perform a robustness check with three alternative definitions of firm-level income: EBITDA, pre-tax income, and net income. The results using EBITDA are consistent with our results. However, the results using pre-tax income and net income are not reliable due to the majority of these firms having negative SER under these definitions.

**Pre-SFAS No. 131 versus Post-SFAS No. 131**

While the pre-SFAS No. 131 reporting period is not the focus of this study, in untabulated results, we compare our findings of the determinants of managers' decision to report SER=0, SER≠0, SER>0, and SER<0 in the post-SFAS No. 131 reporting regime (1999–2006) to a comparable time period in the pre-SFAS 131 regime (1990–1997). Regarding the managers' decision to report SER=0 or SER≠0, we find that the sign and inferences of all the determinants remain the same. In the reporting of SER>0 or SER<0, we find that the significance of all the determinants remains the same, with the exception of the number of the segments reported (NSEG). Its coefficient of 0.2936 has a p-value <0.0001. This finding is not surprising since the primary change from the SFAS No. 14 reporting regime to the SFAS No. 131 regime is, on average, the number of segments reported. Our empirical findings also suggest that the determinants for managers' segment reporting choices do not significantly differ between the two segment reporting regimes.

## SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

This paper investigates determinants of managers' segment financial reporting choices to report segment reconciliations under the SFAS No. 131 segment reporting regime. We first examine whether these differences exist, and because they do, we analyze the significance and value relevance of these differences. We then examine the determinants of managers' decisions to report aggregated segment-level earnings equal to or not equal to consolidated firm-level earnings. This study finds that segment reconciliation differences, when they exist, are significant. Furthermore, our relevance test shows that these segment reconciliations are value relevant.

In addition, our findings show that the agency cost plays an important role in a manager's decision choice for segment disclosure. First, firms that have high agency costs are more likely to report SER=0, indicating they are less likely to report segment reconciliations. These results also suggest that firms that have high proprietary costs are more likely to report SER≠0, and, thereby, provide a segment reconciliation. This signifies that potential entrants could view nondisclosure of segment reconciliations as firms reporting SER=0 in order to avoid disclosure and hide segments with abnormally high profits. Secondly, among firms reporting segment reconciliations, we find that, at firms reporting SER>0, managers' segment reporting choice is partly driven by agency costs.

Our empirical findings also show that firms are more likely to report aggregated segment-level earnings not equal to firm-level earnings when firms are larger, have a greater number of segments, higher leverage, losses, and have greater earnings volatility. However, firms with greater accruals are less likely to report non-zero segment reconciliations. Larger firms, and firms with higher leverage and higher ROA are more likely to report aggregated segment-level earnings than firm-level earnings (i.e., positive segment reconciliations, SER>0). Still, this study finds that firms with a greater number of segments, greater accruals, or larger analyst following, loss firms, firms with greater aggregated segment earnings, and firms with a Big N auditor are less likely to report SER>0. This suggests that Big N auditors may be less concerned with potential legal liability exposure and reputational harm with respect to SERs and that the existence of SERs may not be associated with decreasing conservatism in accounting for segment disclosures.

## LIMITATIONS AND FUTURE RESEARCH

Consistent with most research, this study has potential limitations. This study attempts to contribute towards the development of a body of segment disclosure literature by highlighting determinants, identified by prior research, as possibly applicable to firms with segment reconciliations. As with any study of this nature, a potential exists for specification error in the regression and for correlated omitted variables. However, despite these caveats, this study has the potential to contribute to a greater understanding of management disclosure practices by examining a unique setting where management has discretion to report segment information in a manner that may or may not be consistent with firm-level consolidated earnings reported by the firm.

Future research opportunities include the development of a segment disclosure index related to segment reconciliations. Future research may control for other variables such as CEO compensation, since the CEO is the ultimate decision maker with the management approach to segment reporting under the SFAS No. 131 segment reporting regime. Comparisons of segment reconciliation determinants for companies following GAAP versus International Financial Reporting Standards (IFRS) might prove useful.

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**REFERENCES**

1. Aboody, D., M. Barth, and R. Kasnik.1999. Revaluations of assets and future firm performance: Evidence from the U.K. *Journal of Accounting and Economics* 26: 149-178.
2. American Institute of Certified Public Accountants (AICPA). 1994. Improving Business Reporting—A Customer Focus. Report of the AICPA Special Committee on Financial Reporting. New York. NY: AICPA.
3. Association for Investment Management and Research (AIMR), Financial Accounting Policy Committee. 1993. Financial reporting in the 1990s and beyond: A position paper of the Association for Investment Management and Research. Prepared by Peter H. Knutson. Charlottesville, VA: AIMR.
4. Bartov, E., Givoly, D., Hayn, C., 2002. The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics* 33 (2), 173–204.
5. Basu, S., Hwang L., and C. L. Jan. 2000. Differences in conservatism between big eight and non-big eight auditors, Working Paper, Baruch College and California State University - Hayward.
6. Bayless, R. 2001. Take a fresh look at your annual report. Speech (May).
7. Becker, C.L., DeFond, M.L., Jiambalvo, J., and Subramanyam, K.R. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15: 1-24.
8. Berger, P. and E. Ofek. 1995. Diversification's effect on firm value. *Journal of Financial Economics* 37: 39-65.
9. ——. and R. Hann. 2003. The impact of SFAS No. 131 on information and monitoring. *Journal of Accounting Research* 41 (May): 163-223.
10. ——. and R. Hann. 2007. Segment profitability and the proprietary and agency costs of disclosure. *The Accounting Review* 82: 869-906.
11. Berger, P., and E. Ofek. 1995. Diversification's effect on firm value. *Journal of Financial Economics* 37: 39–65.
12. Bhushan, R. 1989. Firm characteristics and analyst following. *Journal of Accounting and Economics* 11 (July): 255-274.
13. Botosan, C., and M. Harris, 2000. Motivations for a change in disclosure frequency and its consequences: An examination of voluntary quarterly segment disclosures. *Journal of Accounting Research* 38: 329-353.
14. ——. 2005. Managers' motives to withhold segment disclosures and the effect of SFAS No. 131 on analysts' information environment. *The Accounting Review* 80: 751-771.
15. Brown, L. D. 1993. Earnings forecasting research: Its implications for capital markets research. *International Journal of Forecasting* 9 (November): 295-320.
16. Brown S., K. Lo, and T. Lys. 1999. "Use of R2 in accounting research: Measuring changes in value relevance over the last four decades." *Journal of Accounting and Economics*, 28(1): 83-115.
17. ——. G. Richardson, and S. Schwager, 1987. An information interpretation of financial analyst superiority in forecasting earnings. *Journal of Accounting Research* 25 (Spring): 49-67.
18. Chen, P. and G. Zhang. 2002. Heterogeneous investment opportunities in multiple-segment firms and the incremental value relevance of segment accounting data. *The Accounting Review*.
19. Chen, K. and J. Zhou. 2007. Audit committee, board characteristics, and auditor switch decisions by Andersen's clients. *Contemporary Accounting Research* 24(4):1085-117.
20. Chevalier, Judith A., 1999, Why do firms undertake diversifying mergers? An examination of the investment policies of merging firms, Working paper, University of Chicago.

21. Choi, J.H., J-B. Kim, X. Liu, and D. A. Simunic. 2008. Audit pricing, legal liability regimes, and Big 4 premiums: Theory and cross-country evidence. *Contemporary Accounting Research* 25 (2):55–100.
22. Clement, M. 1999. Analyst forecast accuracy: Do ability, resources, and portfolio complexity matter? *Journal of Accounting and Economics* 21 (June): 285-303.
23. Collins, D., Maydew, E., Weiss, I., 1997. Changes in the value-relevance of earnings and book values over the past forty years. *Journal of Accounting and Economics* 24 (1), 39–68.
24. Collins, D. 1976. Predicting earnings with sub-entity data: Some further evidence. *Journal of Accounting Research* 14: 163-177.
25. Darrough, M., Stoughton, N., 1990. Financial Disclosure Policy in an Entry Game. *Journal of Accounting and Economics* 12:219-243.
26. Dechow, P., Ge, W., Schrand, C., 2010. Understanding earnings quality: a review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics* 50, 344–401.
27. DeFond, M. L., and K. R. Subramanyam, 1998, Auditor changes and discretionary accruals, *Journal of Accounting and Economics* 25, 35-67.
28. Deppe, L., and S. C. Omer. 2000. Disclosing disaggregated information. *Journal of Accountancy* (September): 47-54.
29. Diamond, D. and R. Verrichia. 1991. Disclosure, liquidity and cost of capital. *Journal of Finance* (September): 1325-59.
30. Dunn, K., and S. Nathan. 1998. The effect of industry diversification on consensus and individual analysts' earnings forecasts. Working Paper, CUNY – Baruch College, NY.
31. Duru, A, and D. Reeb. 2002. International diversification and analysts' forecast accuracy and bias. *The Accounting Review* 77 (April): 415-433.
32. Dye, R., and Verrichia, R., 1995. Discretion vs. uniformity: choices among GAAP. *The Accounting Review* 70, 389-415.
33. Elliott, J., Philbrick, D., 1990. Accounting changes and earnings predictability. *The Accounting Review* 65, 157–174.
34. Ettredge, M. and Wang, Q. 2011. Discretionary allocation of corporate income to segments: effects on the persistence and price-relevance of aggregated segment income. Working paper.
35. Ettredge, M., S. Kwon, and D. Smith. 2000. The effect of SFAS No. 131 on numbers of reported business segments. Working paper, Iowa State University, IA.
36. Ettredge, M., S. Kwon, D. Smith, and P. Zarowin. 2005. The impact of SFAS No. 131 business segment data on market's ability to anticipate future earnings. *The Accounting Review* 80: 773-804.
37. Ewert, R. and A. Wagenhofer. 2005. Economic effects of tightening accounting standards to restrict earnings management. *The Accounting Review* 80: 1101-1125
38. Financial Accounting Standards Board (FASB). 1976. Financial reporting for segments of a business enterprise. Statement of Financial Accounting Standards No. 14. Stamford, CT: FASB.
39. ——. 1997. Disclosures about segments of an enterprise and related information. Statement of Financial Accounting Standards No. 131. Norwalk, CT: FASB.
40. Fishman, M. and K. Hagerty. 1989. Disclosure decisions by firms and the competition for price efficiency. *The Accounting Review*, 135-50
41. Francis, J. R., Maydew, E.L., and Sparks, H.C. 1999. The role of Big 6 auditors in the credible reporting of accruals. *Auditing: A Journal of Practice & Theory* 18: 17-34.
42. ——. and D. Wang. 2004. Investor protection and auditor conservatism: are big 4 auditors conservative only in the United States? Working paper: University of Missouri.
43. Givoly, D., C. Hayn, and J. D'Souza. 1999. Measurement errors and information content of segment reporting. *Review of Accounting Studies* 4:15-43.
44. Gu, Z., and J. Wu. 2001. Earnings skewness and analysts' forecast bias. *Journal of Accounting and Economics* 35: 5-29.
45. Hann, Rebecca N. and Y. Lu. 2009. Earnings Management at the Segment Level. Marshall School of Business Working Paper No. MKT 04-09.
46. Harris, M. 1998. The association between competition and managers' business segment reporting decisions. *Journal of Accounting Research*: 111-128.
47. Hayes, R., and R. Lundholm. 1996. Segment reporting to the capital market in the presence of a Competitor. *Journal of Accounting Research* 34: 261-279.

48. Hayn, C. 1995. The information content of losses. *Journal of Accounting and Economics* 20: 125-153.
49. Herrmann, D., and W. Thomas. 2000. An analysis of segment disclosures under SFAS No. 131 and SFAS No. 14. *Accounting Horizons* 14 (September): 287-302.
50. Hollie, D. and S. Yu, 2011. Do reconciliations of segment earnings affect stock prices? *Journal of Applied Business Research, forthcoming.*.
51. Hope, O. and W. Thomas. 2008. Managerial Empire Building and Firm Disclosure. *Journal of Accounting Research*. 46: 591-626.
52. Hope, O., W. Thomas, and G. Winterbotham. 2009. Geographic earnings disclosure and trading volume. *Journal of Accounting & Public Policy*. 28: 167-188.
53. Holthausen, R., Larker, D., Sloan, R., 1995. Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics* 19, 29-74.
54. Hwang, L., C. Jan, and S. Basu. 1996. Loss firms and analysts' earnings forecast errors. *Journal of Financial Statement Analysis* 1 (Winter): 18-30.
55. Hyland, David C., 1997, Why firms diversify, An empirical examination, unpublished doctoral dissertation, Ohio State University, Columbus, Ohio.
56. International Accounting Standards Committee Foundation. 2009. International Financial Reporting Standards. IASC Foundation Publications Department (page 858).
57. Khurana, I. and K. Raman. 2004. Litigation risk and the financial reporting credibility of Big 4 vs. Non-Big 4 audits: Evidence from Anglo American countries. *The Accounting Review* 79 (April): 473-495.
58. Kinney, W. 1971. Predicting earnings: entity versus sub entity data. *Journal of Accounting Research* 9: 127-136.
59. Krishnan, G. 2003. Does big 6 auditor industry expertise constrain earnings management? *Accounting Horizons* 17: 1–16.
60. Kross, W., B. T. Ro, and D. Schroeder, 1990. Earnings expectations: the analysts' information advantage. *The Accounting Review* 65 (April): 461-476.
61. Lamont, O. 1997. Cash flow and investment: evidence from internal capital markets. *Journal of Finance* 52: 83–109.
62. Lang, M., and R. Lundholm. 1996. Corporate disclosure policy and analyst behavior. *The Accounting Review* 71 (October): 467-492.
63. Lang, L., and R. Stulz. 1994. Tobin's Q, corporate diversification and firm performance. *Journal of Political Economy* 102: 1248–1280.
64. Lichtenberg, Frank R., 1992, Industrial de-diversification and its consequences for productivity, *Journal of Economic Behavior and Organization* 18, 427–438.
65. Lys, T., and L. Soo. 1995. Analysts' forecast precision as a response to competition. *Journal of Accounting, Auditing, and Finance* 10: 751-763.
66. MacDonald, E. 1997. More accounting firms are dumping risky clients. *Wall Street Journal* (April 25).
67. Mande, V. and R. Ortman. 2002. The effect of Japanese business segment reporting on analysts' forecasts: implications for US investors and the SEC. *Journal of Accounting & Public Policy*. 21: 31-70.
68. Matsumoto, D. A. 2002. Management's incentives to avoid negative earnings surprises. *The Accounting Review* 77 (3): 483–514.
69. Merton, R. 1987. A simple model of capital market equilibrium with incomplete information. *Journal of Finance* (July): 483-510.
70. Montgomery, Cynthia A., and Sam Hariharan, 1994, Diversified expansion by large established firms, *Journal of Economic Behavior and Organization* 15, 71–89.
71. Morck, Randall, Andrei Shleifer, and Robert W. Vishny, 1990, Do managerial objectives drive bad acquisitions?, *Journal of Finance* 45, 31–48.
72. Nagarajan, N., and S. Sridhar. 1996. Corporate responses to segment disclosure requirements. *Journal of Accounting & Economics* 21: 253-275.
73. Paul, L. and J. Largay. 2005. Does the 'management approach' contribute to segment reporting transparency? *Business Horizons*, July/Aug. 2005; 303-310.
74. Penman, S. 2001. *Financial statement analysis and security valuation*. New York, NY: McGraw-Hill Irwin.
75. Piotroski, J. 1999. The impact of newly reported segment information on market expectations and stock prices. Working paper, University of Chicago, Chicago, IL.

76. ——. 2002, Segment reporting fineness and the precision of investor beliefs. Working paper, University of Chicago, Chicago, IL.
77. Reason, T. 2001. Picking apart the pieces. *CFO Magazine* (August).
78. Reynolds, J. K., and J. R. Francis. 2000. Does size matter? the influence of large clients on office level auditor reporting decisions. *Journal of Accounting and Economics* 30: 375-400.
79. Rhoades, S., 1993. The Herfindahl-Hirschman Index. In: Federal Reserve Bulletin, March.
80. SEC v. Richard A. Causey, Civil Action No. H-04-0284 (Harmon) SDTX] (LR-18551; AAE Rel. 1947.
81. Servaes, H. 1996. The value of diversification during the conglomerate merger wave. *Journal of Finance* 51: 1201-1225.
82. Shin, H., and R. Stulz. 1998. Are internal capital markets efficient? *Quarterly Journal of Economics* 113: 531–552.
83. Simunic, D. A., and Stein, M.T. 1996. The impact of litigation risk on audit pricing: a review of the economics and the evidence, *Auditing: A Journal of Practice and Theory* 15 Supplement, 119-134.
84. Street, D., N. Nichols, and S. Gray. 2000. Segment disclosures under SFAS No. 131: Has business segment reporting improved? *Accounting Horizons* 14: 259-285.
85. Stulz, R.M., 1990, Managerial discretion and optimal financing policies, *Journal of Financial Economics* 26, 3-27.
86. Thoman, L., 1996. Legal damages and auditor efforts, *Contemporary Accounting Research* 13, 275-306.
87. Turner, L. 1999. Speech. Conference of the Chicago Chapter of the Financial Executives Institute (October), Chicago, IL.
88. Venkataraman, R. 2001. The impact of SFAS No. 131on financial analysts' information environment. Ph.D. dissertation, Pennsylvania State University, University Park, PA.
89. Wang, Q., M Ettredge, Y. Huang, and L. Sun. 2011. Strategic revelation of differences in segment earnings growth. *Journal of Accounting & Public Policy*. 30: 383-392.
90. Watts, R.L., Zimmerman, J.L., 1986. *Positive Accounting Theory*. Pretince-Hall, Englewood Cliffs, NJ.
91. Wernerfelt, Birger and Cynthia A. Montgomery, 1988, Tobin's q and the importance of focus in firm performance, *American Economic Review*, 78: 246–250.
92. Wiedman, C. 1996. The relevance of characteristics of information environment in the selection of a proxy for the market's expectations for earnings: An extension of Brown, Richardson.

**APPENDIX A**
**Definition of Variables**

| | |
|---|---|
| AGENCY | 1 if the firm is classified as having an agency motive, 0 otherwise (by design these classified have proprietary cost motives). A firm is classified as having an agency cost motive if it has both positive excess capital expenditures (as measured in the model below) and has a return on sales that is less than the weighted average of all the segments in the firm.<br><br>*Max [Segment Excess CAPX – Firm Level Excess CAPX, 0] x 100*<br>*Market Value of Equity*<br>where:<br>*Excess CAPX = max[CAPX – (OPS + DEP), 0];*<br>*CAPX* = capital expenditures (Segment Item CAPX, Firm Item #128)<br>*OPS* = operating profits (Segment Item OPS, Firm Item #178)<br>*DEP* = depreciation expense (Segment Item DP, Firm Item #103) |
| AGENCY (alternative) | 1 if the firm reports earnings for at least two foreign geographic segments in the first two years following the adoption of SFAS 131 (Hope & Thomas 2008). |
| EARN | Operating income after depreciation scaled by total assets (Item #178 / Item #6). |
| SER | Segment reconciliation which is the difference between firm level operating income after depreciation (Item #178) and sum of segment operating profits (Item OPS), scaled by total assets in year *t*. |
| ROS | Fama French (1997) industry-adjusted return on sales (Item #178/Item #6). |
| NSEG | Number of segments in firms. |
| ACC | Firm level accruals which is the difference between income before extraordinary items (Item#18) and operating cash flows (Item#308) divided by total assets, measured in the year immediately prior to the forecasted year. |
| SIZE | Natural log of market value of equity (Item #199 * Item #25). |
| LEV | Total debt over total assets (Item #9 / Item #6). |
| FOL | Number of analyst following in year *t*. |
| MB | Market to book ratio (Item #199 * Item #25 / Item #60). |
| LOSS | 1 if firm level operating income (Item #178) is negative, 0 otherwise. |
| AGSEG | Aggregated segment operating profits (Item OPS) in year *t*. |
| EARN_VOL | Earnings volatility, measured as the absolute value of the standard deviation of EPS over last 5 years (plus current year) scaled by the average EPS. |
| ROA | Net income(loss) over total operating assets [Item #172 / (Item #6-Item #1)]. |
| BIG N | 1 if firm's auditor is a Big N auditor, 0 otherwise. |
| HERF | Sum of the squares of each firm's net sales divided by the sum of net sales for all firms in its respective industry. |
| UE | Operating income after depreciation in year *t* minus operating income after depreciation in year *t-1* scaled by total assets (Item #178 / Item #6). |

 

**APPENDIX B**
**Example of Firm-Segment Reconciliation Differences between Firm-Level and Segment-Level Financial Information for Dover Corporation**

| | For the Years Ended December 31, | | |
|---|---|---|---|
| | **2010** | **2009** | **2008** |
| Earnings from continuing operations — total consolidated (EARN) | 707,908 | 371,894 | 694,758 |
| Earnings from continuing operations - Segments (AGSEG) | | | |
| Industrial Products | 226,385 | 139,757 | 299,740 |
| Engineered Systems | 301,906 | 227,268 | 278,553 |
| Fluid Management | 388,420 | 259,269 | 385,317 |
| Electronic Technologies | 250,428 | 83,694 | 193,641 |
| Total segments (AGSEG) | 1,167,139 | 709,988 | 1,157,251 |
| The amount of SER | -459,231 | -338,094 | -462,493 |
| ***Reconciliation*** | | | |
| Corporate expense/other | 135,714 | 117,995 | 115,195 |
| Net interest expense | 106,341 | 100,375 | 96,037 |
| Provision for taxes | 217,176 | 119,724 | 251,261 |
| Total Reconciliation | 459,231 | 338,094 | 462,493 |
| **Disaggregated Total Assets at Segment-level** | **2010** | **2009** | **2008** |
| Industrial Products | 1,925,495 | 1,874,242 | 2,069,743 |
| Engineered Systems | 1,886,100 | 1,818,750 | 1,729,331 |
| Fluid Management | 1,405,122 | 1,267,388 | 1,231,391 |
| Electronic Technologies | 1,830,833 | 1,751,826 | 1,820,173 |
| Corporate (principally cash and equivalents and marketable securities) | 1,448,211 | 1,053,496 | 963,494 |
| Total continuing assets | 8,495,761 | 7,765,702 | 7,814,132 |
| Assets from discontinued operations | 67,133 | 116,701 | 69,106 |
| Consolidated total Assets | 8,562,894 | 7,882,403 | 7,883,238 |
| **Consolidated Total Assets at Firm-level** | | | |
| Total current assets | 3,261,871 | 2,522,707 | 2,630,119 |
| Property, plant and equipment, net | 847,189 | 828,922 | 872,134 |
| Goodwill | 3,368,033 | 3,350,217 | 3,255,566 |
| Intangible assets, net | 907,523 | 950,748 | 952,409 |
| Other assets and deferred charges | 111,145 | 113,108 | 103,904 |
| Total continuing assets | 8,495,761 | 7,765,702 | 7,814,132 |
| Assets of discontinued operations | 67,133 | 116,701 | 69,106 |
| Total assets | 8,562,894 | 7,882,403 | 7,883,238 |

Form 10-K of Dover Corporation for fiscal year ended December 31, 2010. Dover Corporation reports four reportable segments: Industrial Products, Engineered Systems, Fluid Management, and Electronic Technologies. Dover also provides a reconciliation of firm level consolidated earnings and the aggregated segment-level earnings in note 14 of its 10-K for fiscal year ended December 31, 2010.

**NOTES**

 